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THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

DEVOTED TO THE ADVANCEMENT OF ASTRONOMY AND ALLIED SCIENCES

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THE FIFTIETH ANNIVERSARY OF THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

By C. A. CHANT

THE ORGANIZATION OF THE SOCIETY

THE earliest Canadian astronomical society of which we have any record was The Toronto Astronomical Club which came into existence at a meeting held on December 1, 1868, in the Mechanics' Institute,[1] Toronto, "to take into consideration the propriety of forming a society for the prosecution of astronomical science." There were present: Mungo Turnbull, Andrew Elvins, Daniel K. Winder, James L. Hughes, Samuel Clare, Robert Ridgeway, Charles Potter and G. Brunt.[2] The minute book of this society is in the possession of the Royal Astronomical Society of Canada. The organization of the Toronto Astronomical Club was duly approved, and Messrs. Ridgeway, Elvins, Clare and Turnbull were appointed a committee to draft by-laws for its government. The first regular meeting was held at the home of Mr. Elvins on January 5, 1869. The report of the committee was presented and, with slight modification, was adopted.[3] On May 4, 1869, the name was changed to The Toronto Astronomical Society. The meetings were held in the homes of the members on the first Tuesday of the month and continued regularly

[1] At the northeast corner of Adelaide and Church Streets. Later it was used for the Toronto Public Library.

[2] A sketch of each of these men is given in this JOURNAL, v. 11, p. 51-61, 1917.

[3] The original report of the committee in the handwriting of Mr. Ridgeway on the characteristic blue foolscap paper of the time has very recently been discovered. Ridgeway died April 25, 1912, aged 89 years.

until December 1869, when, through the removal of Mr. Winder and pressure of business matters, they ceased.

The moving spirit in this little band of devotees of Urania was Andrew Elvins. He was born in Cornwall, May 4, 1823, and lived until October 28, 1918. His father was a worker in a tin mine and he himself completed in 1842 his seven-year term as an apprentice to a tailor. During his apprenticeship he attended night school, and having a keen and active mind he read understandingly a number of literary, scientific and religious books, among them, Herschel's "Outlines of Astronomy" and much of Chambers's "Encyclopedia". In 1844 he took passage on a sailing vessel bound for Canada for a return cargo of lumber. There were forty passengers and the voyage lasted six weeks. By way of the St. Lawrence and Ottawa rivers and the Rideau canal he arrived at Kingston and thence went on to Cobourg. There he lived for fourteen years. He was a diligent student of the rocks in the neighbourhood and soon found out others of the town having similar tastes. During 1858 and 1859 Mr. Elvins lived in the nearby town of Port Hope, and then in 1860 he moved sixty miles farther west to Toronto, at that time a town of 44,000 persons. He obtained employment as chief cutter in the "Mammoth House", a well-known clothing store on King Street. Having long hours of labour in the day time he could not satisfactorily study the rocks and so gave his chief attention to the sky, to which however he was not a stranger. He had not been long in Toronto before, as usual, he discovered others with kindred scientific tastes and they often met at his house at 11 St. Vincent St.[4] This manner of life continued for some years and then he thought the time was ripe for a formal organization. Hence the meeting for December 1, 1868, was called.

As already stated, the regular meetings of the society ceased in December 1869; but Elvins did not allow the movement to die out completely. By circulating scientific magazines, such as the "Popular Science Monthly", and by personal contacts he endeavoured to keep the interest alive. In 1882 he met A. F. Miller who was then making preparations to observe the transit of Venus which occurred on

[4]During extensive changes made by the city of Toronto in 1922 this street became a part of what is now Bay St. The house was near Grosvenor St.

December 6 of that year. Mr. Miller was an accomplished amateur astronomer. He possessed a 4-inch refractor and during the next few years acquired a Browning star spectroscope and also a Brashear grating by means of which he observed the solar prominences—probably the first person in Canada to do so.[5]

Somewhat later Mr. Miller introduced George E. Lumsden into the group. As in earlier days, gatherings of the interested ones were held at the different residences but there was no fixed organization and no minutes were kept. Mr. Lumsden was Assistant Provincial Secretary and he proposed that they seek incorporation. At a preliminary meeting, of which no record exists, a committee was appointed to draft a constitution and by-laws for the projected organization; and then on February 25, 1890, a meeting was held at Mr. Lumsden's residence, 719 Ontario St., to receive the report of the committee. With slight changes it was adopted and officers of the new society were chosen as follows:—*President,* Charles Carpmael; *Vice-President,* Andrew Elvins; *Treasurer,* George G. Pursey; *Corresponding Secretary,* George E. Lumsden; *Recording Secretary,* David J. Howell;[6] *Librarian,* A. F. Miller.

Messrs. Lumsden and Miller were appointed a committee to secure incorporation. By them all the legal requirements were fulfilled, and on March 10, 1890, Judge Joseph E. McDougall of the County Court of York County approved of the incorporation of The Astronomical and Physical Society of Toronto, with the officers named above.

It was fully intended that Mr. Elvins should be the first president, but when the committee approached Mr. Charles Carpmael, the Director of the Magnetic Observatory and the Meteorological Service of Canada to ask him to accept the position of honorary president, he expressed a wish to be an active member. At once he was chosen president, with Mr. Elvins vice-president. But Mr. Carpmael was often absent through illness or on account of other duties and the

[5]Mr. Miller, now 87 years old, is still living at his long-time residence on Carlton St., Toronto, in fair bodily health and with a clear intellect, but totally blind. His telescope was secured in 1931 by H. Boyd Brydon, Victoria, B.C.

[6]Mr. Howell for some years has been living at Berrynarbor, Devon, England.

vice-president was generally in the chair. As a matter of fact Mr. Elvins was never elected president although everyone looked upon him as the leader of the little band of students of the heavens for thirty years (1860-1890) and the true father of the incorporated society. If it was ever possible to help someone else into a position of honour he always remained in the background.

The new society was a success from the beginning. Mr. Lumsden was an enthusiastic observer, first with a 10¼-inch reflector, later with a 4-inch refractor by Brashear, and thus had a practical interest in the subject of astronomy. But he also had wide general information and possessed excellent judgment. He helped to provide good programmes, and then dressed up the minutes of the meetings in a form readily acceptable by the local newspapers. Thus was attracted the favourable notice of the people. He was also chiefly responsible for the production of the annual volume of the *Transactions* of the Society and its judicious distribution at home and abroad. In the work of editing he was assisted by Thomas Lindsay as will be mentioned a little later.

Mr. Lumsden held the office of Corresponding Secretary for ten years (1890-1899) and during that time he communicated with leading observatories and other scientific institutions throughout the world and secured promises of their official publications for the Society's library. These are proving useful at the present time. Through his presentation of the work of the Society many noted astronomers became honorary or corresponding members, and by their acceptance of these titles they gave assurance to the world of the good standing of the Society. On October 31, 1893, the officers and members of the Society presented to Mr. Lumsden a beautiful silver urn and a silver inkstand, in recognition of his outstanding services; and he was elected president for 1900 and again for 1901.

In May 1900 chiefly through Mr. Lumsden's efforts the corporate name of the Society was changed to The Toronto Astronomical Society. The alteration was made "for reasons of expediency, but chiefly in order that it may possess the shortest corporate name capable of indicating its objects." At the same time changes in the constitution were made, different classes of members being designated fellows of three grades,—honorary, corresponding and ordinary. The

new name was used for only two years. Before the expiration of Mr. Lumsden's tenure of the office of president there was another change. Having the support of the members and the active co-operation of Joseph Pope, Under-Secretary of State (and an amateur astronomer), application was made to the Governor General of Canada, and through him to His Majesty the King, stating that the Society had decided to change its name to The Astronomical Society of Canada, and soliciting permission to prefix the word "Royal" to this title. This favour was granted, and on application to the Chief Justice of the Common Pleas Division of the High Court of Justice of Ontario the Chief Justice, Sir W. R. Meredith, on March 3, 1903, changed the corporate name of the Society to The Royal Astronomical Society of Canada.

To Mr. Lumsden also should be given the chief credit for so presenting the good work and the needs of the Society to the Minister of Education (Hon. G. W. Ross) that the Provincial Government made an annual grant to the Society to assist in publishing its yearly *Transactions,* and this has been continued, with slight interruption, up to the present. This was of the utmost importance since the membership fee was only $2.00 a year, which was barely sufficient to cover the expense of the meetings. This fee has never been raised, a fact probably unique for any society with similar aims in the whole world.

At the peak of his mental powers and of his usefulness to the community Mr. Lumsden died September 27, 1903, aged 56 years.

When one reads the minutes of the Society in these earlier years, or recalls the minutes themselves as the present writer is able to do, the impression is given of lively interest shown in making actual observations of the sky. The outstanding contributions were by Mr. Miller who persistently applied his telescope and spectroscopes to the sun, the stars (especially novae and variables), nebulae, the aurora, and the light from fire-flies. There was also a sincere desire to provide opportunities for the people to view objects in the sky by means of telescopes.

Affiliated Societies

Apparently as a reflection from the activity of the Society, several smaller astronomical societies came into existence at different places

in Ontario. The Society encouraged these groups by recognizing them as affiliated bodies and by publishing accounts of their meetings.

One of the earliest and most active of these societies was at Meaford. It was instituted in 1893, with Rev. D. J. Caswell as president and Geo. G. Albery, town clerk, as secretary. There were some twenty-five members and they enthusiastically conducted their meetings for a considerable number of years. Our Society printed a report of their proceedings yearly until 1900.

At Simcoe was another group drawn together by Dr. J. J. Wadsworth. He was a distinguished graduate in arts and medicine of the University of Toronto and for thirty-three years was Inspector of Public Schools of the county of Norfolk. He had several telescopes, his last being a 12½-inch reflector which he constructed himself, including the mounting and the machine for grinding the mirror. Wherever he went in his daily work he sowed the seeds of interest in astronomy and his sunny nature helped them to grow. Dr. Wadsworth joined the Society on August 8, 1893; he died March 11, 1905, in his sixty-fourth year.

At Tavistock in Oxford county was another society, with Dr. M. Steele as president and Miss Annie McGregor as secretary. Its first report is for 1896.

Another society was formed in Orillia in 1897. The president was Joseph Wallace, Sr., and secretary Geo. F. Rogers, B.A.

At the meeting of the Society in Toronto, on February 17, 1898, it was stated that a cordial letter had been received from Mr. Rogers who reported great success in their meetings and asked for information regarding the establishment of a library in connection with their society's work. Reference to the Orillia organization is made in the Society's annual volumes for 1898, 1899 and 1900.

In 1901, largely through the zeal of Rev. D. B. Marsh, the Hamilton Astronomical Society was formed. Several of the members had telescopes and the work was carried on for a few years, but after the removal of Dr. Marsh to another field the meetings faltered. In 1908, as we shall see, the organization was revived in another form.

The Owen Sound Astronomical and Physical Society was organized in the 1903-04 winter with a membership of 12. For 1905 the officers were: *President,* J. H. Packham; *Vice-President,* Miss

A. Dobie; *Secretary-Treasurer,* A. L. Danard, M.D.; *Recorder,* Miss C. Pearson. Text-books were studied and papers read by the members. During 1904 the papers were as follows: "Astronomical Observations" by Judge Morrison; "The Celestial Garden" by Ewing Buchan; "Meteors" by A. L. Danard; "The Future of the Solar System" by J. H. Packham; "Time Reckoning" by Thomas Murray.

Meeting Places of the Society

For some years after incorporation, owing to insufficient income, the regular meetings of the Society were held at the residences of the members. The present writer was elected a member on December 13, 1892, at the home of John A. Paterson, 23 Walmer Road.[7] There was a peculiar friendly and neighbourly feeling at these "cottage" meetings, but the Society could not grow properly if they were continued. So we find that at the meeting of July 3, 1893, "the renting of permanent rooms was considered" and within a month accommodation was secured at the Y.W.C. Guild, 19 McGill St. The first meeting was held there August 22, 1893, and they continued in that place until October 1895, when, on the cordial invitation of Dr. J. O. Orr, Chairman of the Technical School Board, the Society moved to

[7]The dates of election of a few persons whose names occur often in the minutes of the Society may be given here: R. F. Stupart, April 22, 1890. President of the Society 1902, '03. For many years director of the Meteorological Service.

A. F. Hunter, May 6, 1890. Was a member of the group before incorporation. General Secretary 1920-23. President 1926, '27.

John A. Paterson, December 2, 1890. President 1896, '97.

A. D. Watson, May 17, 1892. President 1916, '17.

A. T. DeLury, May 2, 1893. President 1910, '11. Gave many addresses, including courses of elementary lectures.

John R. Collins, Aug. 22, 1893. Corresponding Secretary 1902-17, President 1920, '21. Still constantly attends the meetings of the Society.

Goldwin Smith, September 19, 1893. His residence was The Grange which he bequeathed to Toronto.

J. E. Maybee, September 26, 1896. Acted as Recorder and as Treasurer, and contributed a number of papers.

R. S. Duncan, June 11, 1901. Curator 1902 up to the present.

the building occupied by the Technical School,[8] where excellent facilities for lantern slides or physical experiments were available.

In 1898 certain changes were made in the Technical School building which rendered it inconvenient for the Society. The council of the Canadian Institute then kindly provided the required accommodation both for the regular meetings of the Society and for its library. The Institute then occupied its building at 58 Richmond St. East, and the first meeting of the Society held there was on November 1, 1898. The meetings continued here (except for the period January 21 to June 3, 1902, when they were at the University) until 1905. In that year the Institute disposed of its excellent building, but now in a "down-town" area, and purchased the house at 198 College St. This was one of a number of good residences erected a generation before on the north side of College St. on ground leased from the University.

Alterations were made in the building to adapt it to its new use. The Institute had its office and library on the ground floor while upstairs was an auditorium sufficiently large for ordinary meetings. It was arranged that the Society should hold its meetings in the auditorium and should have an adjoining room for its office and library. However, in a few years the traffic on College St. became so noisy and disturbing that the meetings were transferred to the Physics Building of the University where they have continued to the present. The office and library have remained at 198 College St. In the not-distant future it is likely that the University will require the land on which the building is placed, for extensions to its science laboratories. It is hoped that, when that time arrives, a suitable building will be erected in the neighbourhood, to accommodate the numerous societies housed about the University, and having a common meeting room for them all.

The Canadian Institute was founded in 1849 and was given permission to prefix "Royal" to its name in 1914.

Broadening Out: the Ottawa Centre 1906

Having assumed in 1903 the name The Royal Astronomical

[8]The Toronto Technical School at that time occupied the building vacated by Wycliffe College. It was on College St. at the head of McCaul St., where now the Mining Building of the University stands.

Society of Canada it behooved the Council of the Society to take steps to extend its operations and thus become more fully representative of our broad land.

For many years the Dominion Government had been carrying on considerable astronomical work, since such was involved in the survey of our recently acquired western territories and in the delineation of our national boundaries; also, somewhat later, in instituting a detailed geodetic survey of the more thickly populated portion of the country. The outstanding leader in this work was W. F. King. He entered the service of the Dominion Government on September 1, 1872, and bore a highly responsible part in preparing our western lands for settlement. In 1890 he was given the title Chief Astronomer. For a long time he had been trying to have established in Ottawa an astronomical observatory, not just for the determination of time and longitude and latitude, but for astrophysical research as well. At last, in 1901, Parliament voted funds for the purpose. The foundation of the chief building was laid in the fall of 1902 and it was occupied in 1904.[9] On August 30, 1905, there was a total eclipse of the sun, visible in Canada and for the purpose of observing it the Chief Astronomer conducted a large expedition to a station in the interior of Labrador. On this expedition the Royal Astronomical Society of Canada was generously represented; indeed, the Society took the initiative in urging the Government to send an expedition to Labrador to observe the total eclipse of the sun.

In the years 1904-07 the present writer was president of the Society and strongly urged the widening of its work. It was proposed to establish branches at various places throughout the Dominion; and the logical place to began at was Ottawa. The idea was favourably received there and a well-attended meeting to discuss the question was held in the lecture room of the Carnegie Library on December 20, 1906. Dr. W. F. King, on motion of Dr. Otto Klotz, occupied the chair.

In the printed report of the meeting we read: "The chairman

[9]An account of the founding of the Dominion Observatory is given by W. F. King in the *Transactions* of the R.A.S.C. for 1905, p. 27. Dr. King died in 1916 and an appreciative review of his great achievements is given by J. S. Plaskett in this JOURNAL, v. 10, p. 267, 1916.

outlined two courses which might be taken. First, to form an independent society; second, to unite with the Royal Astronomical Society of Canada and be an integral part of the national society, the whole society to be governed by a general council, but each section to manage its local affairs. He pointed out the advantages resulting from union with the existing society in having a medium of publication, which would scarcely be attainable with an independent society. Each member would receive all the publications of the Society, which has secured substantial grants from both the Dominion[10] and Ontario Governments. It intended to issue a bi-monthly periodical and an annual astronomical handbook".

It was unanimously resolved "That an astronomical society be formed at Ottawa as a section of the Royal Astronomical Society of Canada." The following officers were elected: *President,* W. F. King, B.A., LL.D., D.T.S.; *Vice-President,* Otto Klotz, LL.D., F.R.A.S.; *Secretary,* J. S. Plaskett, B.A.; *Treasurer,* R. M. Stewart, M.A.; *Councillors,* Joseph Pope, C.M.G., F.R.S.C.; A. H. McDougall, B.A., and F. A. McDiarmid, B.A.

At the close of the first regular meeting the new section had 104 members. At that time the Society had 162 active members on its list, some of whom were included in the new Ottawa list. There was much astronomical talent at the seat of the Dominion Observatory. The meetings at first were held fortnightly, alternating between technical papers at 3 p.m. at the Observatory for the special benefit of the scientific workers, and more popular programmes in a hall in the city of Ottawa. In the years which have passed changes have been made to suit the conditions, but the branch society is in active existence still.

Changes in the Constitution

It now became necessary to alter the framework of the Society to be in harmony with the new circumstances. There was general approval of the formation of separate local bodies within the Society, but a revision of the Constitution and By-Laws to provide for them

[10]This refers to a grant of $1000 which the Society, with the strong support of the Chief Astronomer, had received from the Dominion Government. Later the grant was raised to $2000.

led to serious difficulties. To change from a local to a nation-wide organization demanded the giving-up of certain privileges by some persons, and that met with opposition. The meetings at Toronto had heretofore been meetings of the whole Society, at which matters of general policy, election of life and honorary members and other matters affecting the entire organization could be summarily settled. Some of the members, especially those of long standing, were loath to agree that the meetings of the new sections should be made by constitution on a par, as to rights and privileges, with the regular meetings held in Toronto. On the other hand the members of the Ottawa section, as represented by their officers, were unwilling to allow that their ordinary meetings should possess fewer powers or privileges than the regular meetings at Toronto. These latter meetings, it was contended, should not be able to legislate for the entire membership of the Society. There was a lurking fear, also, among some of the old members, that possibly in the future some ambitious section might be strong enough to remove the headquarters of the Society from Toronto. The discussion by correspondence was prolonged and apparently not leading to any reasonable result, and Dr. King and Mr. Plaskett made a special visit to Toronto to confer with the Council of the Society in an endeavour to reach a conclusion satisfactory to all parties.

Ultimately it was agreed, (1) that there should be a General Council, elected by all the members of the Society, which should have control over all matters affecting the entire Society; (2) that regular, or ordinary, meetings of the Society might be held at any place approved by the Council, the conduct of such meetings to be by a local committee chosen by the members associated with the place; (3) that the organizations at the various places where meetings are held should not be designated *sections* or *branches,* but each would be a *Centre* of the Society and persons elected there should all be members of the Royal Astronomical Society of Canada.

These principles were embodied in a new draft of the Constitution and By-Laws, which was submitted to all the members of the Society and approved by them. The following are some of its chief provisions:

Constitution

Art. I. The Society shall be called the Royal Astronomical Society of Canada.

Art. II. The Executive Headquarters, the Library, and other property of the Society shall be located in the City of Toronto.

Art. III. The objects of the Society shall be:

(a) To study Astronomy and Astrophysics, and such cognate subjects as shall be approved by the Society and as shall, in its opinion, tend to the better consideration and elucidation of Astronomical and Astrophysical problems; and to diffuse theoretical and practical information with respect to such subjects.

(b) To publish from time to time the results of the work of the Society; and

(c) To acquire and maintain a Library, and such apparatus and real and personal property as may be necessary and convenient for the carrying into effect of the objects of the Society.

Art. V. The Officers and ten additional elective members, together with the past Presidents, and the elected presiding officer for each Centre as hereinafter provided in Article VII, shall form a Council which shall have general charge of the affairs of the Society.

Art. VII. When, at any Centre, a sufficient number of members of the Society desire to organize regular meetings, the Council may by resolution authorize such meetings.

These shall be known as meetings of the Royal Astronomical Society of Canada, and shall be under the control of the Council, which shall make an annual appropriation to defray the cost thereof. Their organization and conduct shall be deputed to a Board of the members comprising them, who shall be elected annually at a special meeting called for the purpose.

From this last article it is clear that a Centre of the Society can have any type of organization as long as it is satisfactory to the general Council. The amount of the annual appropriation is not specified, but a resolution of the Council has fixed it at one half of the fees contributed by the members.

Extracts from By-Laws

IV. Fees. Unless otherwise provided, the annual fee of an active member shall become due and shall be payable on the first day of January in each year. The fee shall be two dollars per annum. If the member is elected before the first day of September the full fee shall be paid; if after that date, in proportion to the unexpired portion of the year.

Any active member at any time, all sums then due being first paid, may compound for his annual contributions by the payment of twenty-five dollars, and become a life member. The Society at an annual meeting, on recommenda-

tion of the Council, may confer life membership on any active member in recognition of services rendered.

V. Meetings of Council. The Council shall meet at the Society's executive headquarters on the call of the President. In his absence, or in case of his refusal to act, any three members of the Council may issue or cause to be issued notices for an emergency meeting.

The fees are collected at the Centre and the total amount is sent to the General Treasurer. The Council, on resolution, returns one half. This is intended to cover local expenses; the other half goes towards the cost of the publications and the general expenses of the Society.

The scheme of organization of the Society is quite simple, but it was some years before the members meeting at Toronto became accustomed to the new conditions. From the earliest days the meetings had been held at Toronto and had been conducted by the general officers of the Society and the expenses had been paid from the general funds. Some considered it unnecessary to have separate local officers and a separate local budget. However, there were times when neither the president nor the vice-president of the Society was available to preside at the meetings, and at last it was found advisable to form a local organization and receive a grant from the general Council for carrying on the meetings.

A difficulty arose in determining the Centre to which certain elected members should belong. Toronto being the headquarters of the Society, it is quite natural that persons from all parts of the world should apply there for membership. Should they be attached to the local Centre? The question was finally settled by a change in the By-Laws which was duly submitted to the members, as required by the Constitution, was approved by them and was finally ratified by the Council of the Society on December 2, 1930. The amendment is as follows:

Amendment to By-Law II: Candidates who are elected to membership will be attached to a particular Centre, or to a section known as *Members at Large*. Members of the Society who live outside of Canada, or in a province in which there is no Centre of the Society, will be considered *Members at Large* and not attached to any particular Centre, unless these members are expressly nominated for membership and attachment to a particular Centre. Members may be transferred from one Centre to another, or to the section

Members at Large by the Council of the Society if written application for such transfer is made by such member to the Council.

By the test of experience the Constitution and By-Laws have proved satisfactory. They are adapted to the conditions prevailing in our extended and democratic country. The only requirement for success is that our members should not grow weary in well doing.

Other Centres of the Society

Peterborough, 1907

The organization of branches of the Society proceeded rapidly. On February 26, 1907, a lecture was given in Peterborough on "A Night with the Stars" by Rev. D. B. Marsh, who was a minister in Springville, a nearby village. After the lecture he outlined the work of the Society and it was decided to undertake the formation of a Centre. A committee was appointed to draft a constitution and when it met on March 9 it adopted the constitution of the Ottawa section. The following officers were chosen: *President,* Rev. D. B. Marsh, Sc.D.; *1st Vice-President,* William Pringle; *2nd Vice-President,* Duncan Walker, B.A.; *Treasurer,* D. E. Eason, B.A.Sc.; *Secretary,* F. C. Neal, M.D.; *Councillors,* S. W. Lowry, W. A. McFall, M.D.

The formal inaugural meeting was in the Y.M.C.A. lecture room on April 5, and the membership then was 47. The meetings were held at first in the Y.M.C.A. rooms and later in the Collegiate Institute. Besides the regular monthly lectures the new society organized a series of parlor meetings at the homes of members, which were declared to be very successful. The regular meetings continued until the end of 1913, at which time, it is noted, Dr. Marsh moved to a new charge at Holstein. There are no printed reports for 1914 or 1915, and a public lecture by W. E. Harper, then of Ottawa, on February 11, 1916, failed to revive the work of the Centre. The membership of the Society residing at or near Peterborough for 1915 is given as 11.

Hamilton, 1908, 1930

In Hamilton there had been in existence for many years a well-known body called the Hamilton Scientific Association and the Hamilton Astronomical Society was a division of it. A meeting of

the latter was held on December 15, 1908, at which Rev. D. B. Marsh explained the organization and objects of the Royal Astronomical Society of Canada, and he proposed to the members of the Hamilton Society that they abandon their charter and form a Centre of the national society. This was agreed to and a list was obtained of 35 persons who wished to apply for membership in the Society. At a meeting of the Council on December 22, 1908, Dr. Marsh and G. Parry Jenkins presented the request from Hamilton for the formation there of a Centre and on motion the request was acceded to. The 35 persons were elected members of the Society at its annual meeting on January 12, 1909. The officers of the new Centre were: *President,* G. Parry Jenkins, F.R.A.S.; *Vice-President,* William Bruce; *Secretary,* E. H. Darling, C.E.; *Treasurer,* A. T. Neill; *Councillors,* J. J. Evel, T. H. Wingham. The first regular meeting of the Centre was on January 15, 1909, and by that time the membership was 56.

The meetings of the Centre continued in good strength for about six years when the Great War began to show its deadening effect on the activities of everyone, and the last meeting was held on April 14, 1916. Officers for 1917 were elected but there is no record of any meetings during that year.

The Centre was dormant until 1930. Having received the assurance that the Council of the Society would approve the reorganization of the Centre, provided a sufficient number of members could be secured, a meeting was held on April 8, to discuss the matter. There were about 200 present, including some of the original members of the Centre. A resolution to reorganize was carried and Mr. John A. Marsh (son of Rev. D. B. Marsh) was chosen president of the new body, of which 68 persons expressed a desire to become members At about this time McMaster University was beginning its excellent work in Hamilton and members of its faculty took an active interest in the new Centre which has grown into a sturdy limb of the Society tree.

When the Centre was re-organized Rev. D. B. Marsh was chosen Honorary President, and he continued such until his death in 1933. During the years 1934-39 Mrs. Marsh was accorded that honour.

Winnipeg, 1909

The Astronomical Association of Western Canada was organized

at Winnipeg on September 22, 1909, and two months later N. B. McLean,[11] Professor of Mathematics and Astronomy in the University of Manitoba, was asked to become president. The meetings thereafter were held in the University buildings with the assistance of its equipment, including a 5-inch telescope. In November 1910 the Association made application to the Council of the Royal Astronomical Society of Canada to become a Centre of the Society. This was cordially approved and the Centre began its career with the following officers: *President,* Professor N. B. McLean; *Vice-President,* C. E. Bastin; *Secretary,* C. V. Stout; *Treasurer,* Frank Powell; *Councillors,* Mrs. L. B. Ireland, H. C. Howard, R. E. Collins, Father J. Blain, Mrs. Kemp.

The meetings have been continued to the present time. During the war years the membership dropped but in 1920 there was a decided increase, which has been maintained ever since. This is another example of the advantage of close association with a good university.

Regina, 1910

On February 18, 1910, a meeting was held of those interested in the formation of an astronomical society, and a week later, on February 25, the Saskatchewan Astronomical Society was organized, with the following officers: *Honorary President,* William Trant; *Honorary Vice-President,* P. McAra, Jr.; *President,* Norman MacMurchy, B.A.; *1st Vice-President,* H. Lang, B.A.; *2nd Vice-President,* Mrs. J. F. Bryant; *Treasurer,* J. F. Bryant; *Secretary,* H. S. McLung; *Councillors,* C. B. Keenleyside, B.A., J. E. Doerr and Miss E. D. Cathro, B.A.

The first meeting was held on March 4 and was addressed by Mr. Trant, his subject being "Going to the Heavens with a Yardstick." He explained how celestial measurements are made. On March 18 a paper on "How to find a Star", and one April 1 on "Fixed Stars", were given by A. J. Pyke, B.A., who had been very active in bringing about the formation of the Society. The meetings were usually held in the Collegiate Institute.

[11]Neil Bruce McLean was a fellow student with the late W. E. Harper in mathematics and physics at the University of Toronto, both receiving the B.A. degree in 1906. Later he became actuary for the Sun Life Insurance Company and is now Professor of Mathematics in McGill University.

In May application was made to the Council of the R.A.S.C. to have the organization become a Centre of the Society. The necessary formalities having been fulfilled, the application was approved by the Council on October 11, the membership numbering 27. The present writer had the pleasure of lecturing before the Regina Centre on July 26, 1910, on "The Universe of Stars." A 4½-inch refracting telescope with equatorial mounting was presented to the Centre by Justice J. T. Brown.

The meetings continued until the end of 1914 but, as in other Centres, the blighting effect of the war was only too evident and they were withheld until more settled times. In 1915 the number of members reported was 16. Peace came but the Centre was not revived and now another war is upon us. It is much to be desired that at some future date a Centre of the Society should be organized in Saskatchewan. Excellent talent exists there to carry on the work. The chain of beacon-lights across the continent should be complete!

Guelph, 1911

The organization meeting of the Guelph Centre was held on April 27, 1911, in the lecture-room of the Public Library. There were 76 citizens of Guelph who had agreed to become members of the new Centre, among them being six professors at the Ontario Agricultural College. The officers chosen were: *Honorary President,* Col. A. H. Macdonald, K.C.; *Honorary Vice-President,* Dr. W. F. Savage; *President,* Henry Westoby; *1st Vice-President,* Professor W. H. Day, B.A.; *2nd Vice-President,* Dr. J. Lindsay; *Secretary,* H. E. S. Asbury; *Recorder,* J. T. Luton; *Treasurer,* H. J. B. Leadlay; *Councillors,* Dr. A. H. Hobbs, Rev. W. J. Wilson, W. C. McLaren, W. Tytler, M.A., Mrs. H. J. B. Leadlay, Mrs. W. O. Stewart.

The meetings usually were held in the Public Library hall. In 1912, 7 meetings were held; in 1913, 6; in 1914, 9; in 1915, 7; in 1916, 6. By this time the number of members in good standing had been reduced to 22. War work was driving out all other activities, and a year later the meetings were definitely suspended until more favourable times.

Victoria, 1914

The great observatory at Victoria was authorized by the Dominion

Government as early as 1913 and it was formally opened on June 11, 1918. While on a visit to Victoria in the spring of 1914, Dr. J. S. Plaskett of Ottawa, then President of the R.A.S.C., gave an address at a public meeting held on March 6, and it was then decided to take steps to organize at Victoria a Centre of the Society. There were 58 persons present, all of whom decided to become members of the Society. The application of these persons to be formed into a new Centre was considered at a meeting of the Council of the Society on April 28 and was gladly sanctioned.

The first officers were: *Honorary President,* Dr. J. S. Plaskett; *President,* F. Napier Denison; *Vice-President,* A. W. McCurdy; *Secretary-Treasurer,* E. H. Cotterell, C.E.; *Councillors,* W. S. Drewry, W. J. Sutton, G. G. Aitken, C. B. Simonds.

The presence of the Dominion Astrophysical Observatory, which soon achieved world-wide distinction; the fact that there are many technical men in the Government service at Victoria; and also the existence there of a considerable body of persons who have retired to that favoured place; all these things gave assurance that the Centre would have an active and useful life. This has been amply fulfilled.

The Victoria Centre has undertaken activities not attempted at any other place,—such as a summer session and courses including prize contests for junior members, the organization of a telescope-making section, the introduction of talks on "Current Phenomena" and the policy of securing outside authorities to lecture on branches of activity not strictly astronomical. All these things have been found of decided value at Victoria.

As in some other places, the early years of the Centre were seriously affected by the war and the membership was reduced, but in the following years it rose again. In the report covering the year 1939 the number of members is reported to be 114.

Montreal, 1918

For some years it had been considered anomalous that the great commercial, educational and cultural city of Montreal should not have a Centre of the Society. A communication from Rev. W. T. B. Crombie of Kingsbury, Quebec, a member of the Society, suggesting the formation of a Centre, was considered by the Council of the

Society on February 22, 1918, and was given encouragement. Mr. Crombie then wrote to all the members residing in the Province of Quebec, fourteen in all, inviting them to a meeting on May 28, to consider the organization of a Centre. It was held in the Engineering Building of McGill University through the courtesy of Professor James Weir. Those present were: James Weir, B.Sc., Montreal; H. E. S. Asbury, Westmount; Mgr. C. P. Choquette, M.A., Lic. Scs., St. Hyacinthe; Lt. Col. W. E. Lyman, B.A., Montreal; George Sample, Montreal; John Corway, Montreal; Rev. W. T. B. Crombie, M.A., B.D., Kingsbury.

All the members were favourable to the proposal and the following officers were elected: *President,* Mgr. C. P. Choquette; *Vice-President,* H. E. S. Asbury; *Secretary-Treasurer,* Rev. W. T. B. Crombie; *Councillors,* George Sample, Prof. James Weir, Lt. Col. R. Wilson, Lt. Col. W. E. Lyman, John Corway. A report of what had been done at this meeting was presented to the Council of the Society on June 21, 1918, and was unanimously approved. The inaugural meeting of the Centre was held on September 12, and was addressed by Dr. Otto Klotz, Chief Astronomer and Director of the Dominion Observatory at Ottawa.

The Centre is fortunate in its association with McGill University and in its convenient location for receiving visits from scientific workers in the not distant cities of Ontario, Quebec and the eastern United States. It has had efficient secretaries. One may be allowed to refer to Rev. Mr. Crombie who acted for five years at the beginning and Miss A. Vibert Douglas who served from 1924 until her removal to Queen's University, Kingston, in 1939.

London, 1922

After some correspondence with the General Secretary of the Society and in accordance with its Constitution, a meeting was held on February 11, 1922, for the purpose of organizing the London Centre of the Royal Astronomical Society of Canada. The following officers were elected: *President,* H. R. Kingston, Ph.D.; *Vice-President,* Miss Grace Blackburn; *Secretary-Treasurer,* E. T. White, B.A., D.Paed.; *Councillors,* Rev. R. J. Bowen, H. B. Hunter, Mrs. S. C. Moore, J. C. Middleton and W. A. McKenzie.

A Constitution and set of By-Laws were drafted in conformity with those of the Society, and 31 persons were elected members.

These proceedings were largely due to the initiative of Prof. H. R. Kingston, who was formerly secretary of the Winnipeg Centre and who had been appointed on the staff of the University of Western Ontario at London. Professor Kingston had given a number of lectures on astronomy which aroused much public interest. By the end of the year 1922 the number of members had increased to 50.

The London Centre ever since organization has been very active and the general interest aroused has contributed to the erection of the fine new students' observatory which the University will soon receive. It is a gift from Mrs. Frances Amelia Cronyn of London in memory of her late husband, Hume Cronyn. It is called the Hume Cronyn Memorial observatory and is described by Professor Kingston in the March 1940 issue of this JOURNAL. There it is stated that the purpose of the gift is to aid in the teaching of astronomy in the University, to encourage the work of the London Centre of the Royal Astronomical Society of Canada, and, in general, to stimulate in the public mind an interest in astronomy. It is also hoped that a modest programme of research may be undertaken.

That the London Centre gains greatly from its association with the University of Western Ontario is very evident. The present writer wishes to express the hope that this association may long continue.

Vancouver, 1931

A meeting was held in Vancouver on November 10, 1931, to discuss the formation of a Centre of the Society in that city. Following this a list of 22 prospective members, with the promise of more, was sent by H. C. B. Forsyth to the General Secretary at Toronto. The Council of the Society approved the formation of the Vancouver Centre; and the officers for 1932 were chosen as follows: *Honorary President,* Dean D. Buchanan; *President,* G. M. Shrum, M.A., Ph.D.; *Vice-President,* Stanley Burke; *Recorder,* H. Grayson Smith, M.A., Ph.D.; *Treasurer,* J. L. Bennett; *Councillors,* Mrs. M. A. Kelk, Mrs. C. M. Robson, F. R. Williams, T. J. McGill, J. A. McKenzie, H. A. Pitman, A. Outram.

By the end of the year 1931 the membership had risen to 71, and although this number has not been maintained, the Centre has been very active since its organization. Here again the interest taken in the Centre by the staff of the University of British Columbia has been of great advantage to it.

Edmonton, 1932

Under date October 19, 1931, Prof. J. W. Campbell of the University of Alberta wrote to the headquarters of the Society asking for information regarding the procedure in organizing a Centre, and following this a meeting was held on January 14, 1932, at which a large number of persons interested in astronomy were present. To them the requirements demanded by the Constitution of the Society were explained. This led to another meeting, on February 3, at which nearly sixty persons signed a petition to the Council of the Society asking permission to form a Centre at Edmonton. This came before the Council on March 18 and authorization was granted under the conditions required by the Constitution. All the conditions were fulfilled and the Centre was established.

At a subsequent meeting officers were elected as follows: *President,* Dr. J. W. Campbell; *Vice-President,* Prof. E. S. Keeping; *Secretary,* Miss Frances M. Fisher; *Treasurer,* Dr. E. H. Gowan; *Councillors,* Father Englebert, Mrs. J. G. Taylor, Miss M. Simpson, Capt. H. J. Towerton, K. F. Alexander.

During 1932 the Centre held nine regular meetings and one special meeting in honour of the British scientists belonging to the second Polar Year Expedition. In each of the years 1933-39 there have been seven regular meetings and the annual meeting as well as a banquet and a picnic. The membership has ranged from 54 in 1934 to 43 in 1939.

Calgary, 1935

In the year 1935 a number of citizens of Calgary having an active interest in astronomy formed themselves into a group which the Council of the Society recognized as the nucleus of a Centre. Officers were chosen as follows: *President,* H. C. King; *Vice-President,* H. J. Rees; *Secretary-Treasurer,* G. Finlay Moore. However, sufficient

members for a satisfactory organization could not be secured and the formation of the Centre could not be completed. Let us hope that the proposal has been simply postponed, not abandoned.

In the meantime the Calgary group keep busy with their discussions and their observations carried on with the aid of a number of good instruments belonging to the members.

NUMBER OF ACTIVE MEMBERS

(On January 1 of the years given)

Centre	1893	1895	1900	1906	1909	1915	1920	1925	1930	1935	1939
Toronto...	88	98	88	172	200	141	176	239	260	177	188
Ottawa....					121	93	92	62	67	65	58
Peterboro'.					23	11	4				
Hamilton .					70	26	10		82	58	54
Winnipeg .						20	48	47	46	38	38
Regina....						16	4				
Guelph....						30	18				
Victoria...						83	50	67	117	122	114
Montreal..							39	84	114	123	115
London...								41	52	48	47
Vancouver										48	32
Edmonton										48	43
At Large..										115	225
Total.....	88	98	88	172	414	420	441	540	738	882	914

In the years 1909-1930 the "outside" members now denoted "At Large" are included in those credited to Toronto.

The Centres are arranged chronologically in the order of organization.

In closing this account of the organization of the various Centres of the Royal Astronomical Society of Canada it may be remarked that the Council has never taken the initiative in urging the formation of a Centre at any place. The organization is much more likely to be permanent when the demand for it comes from the members themselves.

In the accompanying table is given the number of active members at the Centres of the Society for certain years between 1893 and 1939. It illustrates very well the growth of the Society. In 1893 there were 88 members; in 1939, the total is 914.

The locations of the Centres range from Victoria in the far west to Montreal in the east. Surely there should be a Centre in the maritime provinces. Perhaps one down by the sea would help to bring the provinces there closer together; it would certainly unite them in thought with the rest of the Dominion.

There is inter-visitation of the members of the Centres, thus cultivating talent as well as a friendly spirit.

The service rendered to Canada by our chain of organizations across the land cannot be calculated. They help to keep raised high the torch of pure learning in this world of turmoil and war and they minister directly to the education, culture and happiness of the people.

Astronomy all through the centuries has done much to mould the thought of the people, and it will continue to be a power in the intellectual development of the Canadian nation.

The Publications of the Society

During the first fifteen years of its existence the Society published annual volumes which contained its *Transactions* and its *Annual Report*. The first is for 1890-91, the interval being from February 25, 1890, the date of the inaugural meeting, until February 24, 1891. During 1891 the business year of the Society was made to end on December 31. Consequently the second annual volume is entitled "Transactions of the Astronomical and Physical Society of Toronto for the year 1891, including Second Annual Report." The series continued uniformly, the pages being 5½ by 8 inches, until the volume for 1901, which included the Twelfth Annual Report; but for 1900 and 1901 the name of the society was The Toronto Astronomical Society.

George E. Lumsden, as has already been stated, was Corresponding Secretary from 1890 to 1899, when he became President for two years, 1900, '01. In the years 1895-97 Thomas Lindsay was Assistant Secretary and Editor and during 1898-1900 he was Recording Secretary and Editor. He died in 1901. From 1890 to 1894 Mr. Lumsden was chiefly responsible for the contents and the form of the publications and it may be confidently assumed that until 1900 he exercised a wise supervision over everything which went into the volumes. The name of the editor does not appear up to 1900. The volumes were distributed to members and to observatories and institutions throughout the world and brought credit to the Society.

In the volume for 1901 the name of Arthur Harvey is printed on the title page as Editor and among the officers for 1902 he is listed as Editor. It may be noted that in the By-Laws adopted October 16, 1900, no such officer is found, although "The Council at its discretion may appoint an Editing Committee, which may or may not consist of members of the Council, and also an Editor." Mr. Harvey had been President of the Society in 1898 and '99.[12]

The *Transactions* for the years 1902 and 1903 were published in a single volume bearing the title "Selected Papers and Proceedings." It was edited by Mr. Harvey. The printed page is larger than before, being 6 by 9 inches, the size which has been used by the Society ever since. In this volume is printed the text of the documents by which the Society acquired the right to prefix the title "Royal" to its name. In addition one finds: "A Catalogue of Aerolites" by W. H. S. Monck, "Shooting-stars vs. Uranoliths" by Arthur Harvey; "Solar Phenomena and Terrestrial Effects" and "Radium and its Bearing on Astronomical Physics" both re-digested by Mr. Harvey; and an interesting paper on "Women's Work in Astronomy" by Elsie A. Dent, then Recorder of the Society.

The volumes for 1904 and 1905, which also bear the title, "Selected Papers and Proceedings", were edited by the present writer who at that time was president of the Society.[13]

[12]Arthur Harvey was a retired newspaper writer, civil servant and statistician, and his investigations into solar-terrestrial phenomena led to his election as Honorary President and Director, La Institutio Solar Internacional, Monte Video, Uruguay. He died April 7, 1905.

[13]The writer may perhaps be allowed to relate an incident, using the first person. The 1904 volume was ready early in 1905, and the printing of it had

The annual volumes varied greatly in thickness, the number of pages in succession, beginning with 1890, being as follows: 40, 80, 122, 164, 174, 188, 140, 170, 160, 124, 48, 164, 144 (1902 and 1903), 118, 210 (1905).

No separate volume was published containing the proceedings of 1906. This would naturally have been ready early in 1907. Instead of that, with the approval of the Council, the *Journal of the Royal Astronomical Society of Canada* was started. It had been proposed to call it the *Canadian Astronomical Journal,* but the Council preferred the other name. It began as a bi-monthly, six issues a year, and the first number (January-February, 1907) contained 80 pages, frontispiece and two plates. Reference will be made to its contents a little later. The other five issues appeared during the year and Volume I was declared to be a success. The present writer as Editor had secured as Associate Editors Chief Astronomer W. F. King and Astronomer J. S. Plaskett of Ottawa and Director Stupart of the Meteorological Service, Toronto, and they had furnished a number of excellent articles.

The Editor was very anxious that this new undertaking should meet with approval. He strongly supported the formation of Centres throughout Canada and to have them work together effectively it was necessary to have a bond of union which the JOURNAL would be. For eight years it continued to appear at intervals of two months, and then in 1915 it became a monthly, but with one number for May-June and another for July-August, and thus ten issues in the year. That has continued up to the present time, the volume for 1940 being the 34th.

absorbed most of the funds of the Society. At that time it was receiving an annual grant of $300 from the Ontario Government; and so one morning I walked over to the Parliament Building to see the Provincial Treasurer. The Hon. Colonel Matheson was in and I was admitted to his office without delay. I told him who I was and said I had come to ask about money. He said our grant was in the Estimates and we should receive it. "But", said I, "we think we should have more." He walked into his inner office and brought out our new volume, a copy of which had been sent to each member of hte Legislature. "How much do you want?" he asked. I replied, "We think we should have $500." "Five hundred additional?" "Oh", said I, "we are modest, but we think we should have a grant of $500." He said he would consult his colleagues, but as I was leaving he remarked, "I think your publication very creditable". A few weeks later there came addressed to me a check for six hundred dollars!

The first issue of our annual handbook for observers was published in 1907, bearing the name "The Canadian Astronomical Handbook." It contained 108 pages and included an excellent article of eleven pages on "The Study of Variable Stars" by J. Miller Barr, of St. Catharines, which was afterwards reprinted in *Popular Astronomy*; and one of five pages on "Observing the Sun, Moon and Planets" by Andrew Elvins. In 1908 the handbook had 94 pages and included a list of the officers and members of the Society which ran to twelve pages. This publication proved rather expensive and Council seemed to fear that the editor would lead the Society into bankruptcy. To avoid this undesirable result they suggested that the predictions of phenomena for two months at a time be printed in each number of the JOURNAL. This was tried out for two years but it did not work out well, chiefly for two reasons. First, the material for the JOURNAL could not always be assembled and the number printed precisely on time; and secondly, it was very desirable to have all the information brought together into a small book which could be slipped into the pocket. In the meantime the Dominion Government, undoubtedly kept well informed by our trusty friends at Ottawa, had increased its grant from $1000 to $2000, and the publication was resumed in 1911. The name now given to it was "The Observer's Handbook." It contained 64 pages and the contents were very similar to those at present. With the ready assistance of the editor's colleagues and friends, especially those at Ottawa and Victoria and latterly at the David Dunlap Observatory, the *Handbook* has continually improved. In the last few years its circulation has greatly increased. Not only is it supplied to the Society's members and exchanges but it has been placed on sale at various planetariums and has been used by classes at numerous colleges. In 1939 some 2500 copies were disposed of and of the 1940 edition 3000 copies were printed. The *Handbook* for 1940 is the 32nd issue.

In 1937 Dr. Frank S. Hogg permitted his name to be put on the JOURNAL as Assistant Editor and in 1939 it was similarly placed on the *Handbook*. It is a great satisfaction to the present writer to be relieved of much responsibility and labour by Dr. Hogg's able and loyal assistance.

During all these years the Society has had the generous support of the Dominion and Ontario Governments. Without it our publications would not have been possible. We believe the money has been spent to the great adantage of our country and it is gratifying to have this fact recognized by the authorities.

The JOURNAL and the *Handbook* are strong bonds uniting the membership of the Society in all its Centres and At Large and they have helped to place the scientific work of Canada before the world. The editor has also endeavoured to be of use to our observatories by offering a quick and ready means of making public the results of some of their investigations. When the people are informed they will support a worthy undertaking.

THE SOCIETY'S PRINTERS

The annual volumes for 1890 and 1891 were printed by Brough and Caswell, well known commercial printers. The next "Printers to the Society" were Rowsell and Hutchison, an old-established firm which had been printers to the University of Toronto for many years, and had a great variety of type. Their location was 74 and 76 King Street East. The junior partner in the firm was Charles P. Sparling who long served the Society, first as Recording Secretary and then as Treasurer. The volumes for 1899 and 1900 were printed by the Carswell Company, which specializes in law printing. From 1901 to 1905 Mr. Z. M. Collins, a member of the Society, printed the annual volumes and he undertook the JOURNAL when it was started in 1907. This he continued until April 1919 when he removed from the city of Toronto. Since then the printing has been done by the University of Toronto Press, which was organized to do the printing required by the University and is well equipped to handle technical material.

The first two issues of the *Handbook* (1907 and 1908) were printed by R. G. McLean. Mr. Z. M. Collins followed with the volumes for 1911 to 1919 and the University Press has served the Society from 1920 to the present. The printing for the Society has always been done in a creditable manner.

The Transactions and The Journal

In the accounts of the meetings which appear in the *Transactions* there are continuous reports of observations by Lumsden, Elvins, Miller, Collins, Donaldson (Fergus) and others spread over the province which even now have a freshness and interest for the reader. Another early feature was the number of papers contributed by distant astronomers, mostly distinguished amateurs interested in the Society, among them, T. E. Espin, J. E. Gore, W. F. Denning, Agnes M. Clerke and S. E. Peal.

The topic which is most frequently discussed is a telescope or a popular observatory for Toronto. On January 27, 1891, Mungo Turnbull urges a public telescope. On May 17, 1892, William Houston,[14] a well known educationist and newspaper writer, gave a paper on "Astronomy in the Provincial University." This was an admirable statement of conditions at the University and a plea for expanding the instruction in astronomy there, especially on the practical side. At about this time, the present writer remembers, Mr. Houston introduced in the University Senate, of which he was a member, a resolution that $25,000 be provided to build an observatory. Other communications came to the Society advocating that the elements of astronomy be taught in the schools. On January 10, 1893, it was reported that a deputation had waited on Hart A. Massey, who was about to erect a large music hall as a gift to the citizens of Toronto, to ask if an observatory could not be included in the building, together with a room for the Society's meetings. Mr. Massey regretted that the plans were too far advanced to be altered but hoped that at some future date he might be permitted to assist in such a project. At the meeting on September 18, 1894, an account of the recently established Chamberlin Observatory in Denver, Colorado, was read; and in the minutes we find: "After some discussion, it was moved by Mr. Arthur Harvey, seconded by Mr. G. E. Lumsden, That the proposal to establish a popular observatory be referred to the Council, with a recommendation to take immediate action. Carried".

On April 28, 1896, Mr. Lumsden addressed the meeting on the

[14]Elected a member of the Society, Feb. 9, 1892.

subject, "A Popular Observatory", and briefly outlined his views, which had been set forth at length in a paper he had read before the Canadian Institute. He did not urge a giant telescope, but instruments of moderate size, which would be more effective for the purpose in view. On July 12, 1898, Mr. Lumsden read by special request a paper on "A Popular Astronomical Observatory", which discussed the whole question in an admirable way. It was full of information regarding meteorological conditions, size of instruments, their cost and what had been accomplished with the large and the small ones, and also where the funds might come from. A Council meeting was called for July 19 to discuss the question of the establishment of a popular observatory. Mr. Harvey, the president, believed that "an effort should be made with the assistance of the ladies of the Society to raise by popular subscription a sum sufficient for the purpose in view." Mr. John A. Paterson "stated that in his opinion a system of canvassing for subscriptions would not succeed where the object was a scientific one." Then follows: "Mr. Elvins thought that it was only by the aid of the University of Toronto that the object could be accomplished. Messrs. Lumsden, Stupart and DeLury were of the same opinion. Mr. DeLury spoke at some length to show that unless an observatory were directly connected with an educational institution it would be impossible to make it a success." A committee of four was appointed to confer with the authorities of the University of Toronto and the Minister of Education to discuss joint action in the matter. The discussion was of great value—but no observatory was built.

In these early volumes may be mentioned four mathematical papers by Joseph Morrison,[15] the titles being: "The Disappearance of Saturn's Rings" (1890), "Solar Heat" (1891), "The Solar Parallax" (1894), and "Special Perturbations" (1894, pp. 112-144). In the years 1895-99 Thomas Lindsay contributed six papers on the "History of the Nautical Almanac", and the series was unfortunately

[15]Joseph Morrison, M.D., M.A., had been a high school teacher in Ontario, and was the author of an excellent text-book on "Plane Trigonometry" which the present writer used to good advantage as a student in 1883. He had been appointed Assistant in the American Nautical Almanac Office in Washington.

cut short by his death. Then there was the question of the change of the astronomical day from mean noon to midnight, which the Canadian Institute and the Society were trying to secure (1893, 1894). The proposal did not succeed then but it has been adopted since.

Perhaps the present writer may be allowed to refer to a lecture on Electric Radiation which he gave to the Society on November 26, 1895. By means of apparatus constructed at the University, the production, transmission, reflection, refraction and polarization of electric waves were demonstrated, thus showing them to be identical in nature with light-waves. During that same year in experiments abroad signals were sent a mile, which was soon increased to a thousand; and now we listen to persons speaking at the ends of the earth by means of these waves.

Among the notable papers in the volume for 1904 may be mentioned, "The Relation of Philosophy to Ancient and Modern Cosmogonies" by Professor John Watson, "Observations on Variable Stars" by J. Miller Barr, "The Energy of Stellar Collision" by A. W. Bickerton, "An Elliptic Solar Halo" by A. F. Hunter, and "The Shelburne Meteorite" by L. H. Borgström. At the meeting of the Society on October 4 the two meteorites which fell at Shelburne, Ont., on the evening of August 13 were on exhibition. The paper just mentioned is an exhaustive scientific report on the smaller stone which weighed 12½ pounds.

The volume for 1905 is larger than any of its predecessors and it contains much interesting material. The frontispiece is a photograph of the new Dominion Observatory at Ottawa. The following papers are included in it. "The Dominion Observatory at Ottawa" by W. F. King; "Sun-spots and Magnetic Storms for 1904" by Arthur Harvey; "The Eclipse Expedition to Labrador, August 1905" by A. T. DeLury; "Gravity Determinations in Labrador" by Louis B. Stewart; "Magnetic and Meteorological Observations at North-West River, Labrador" by R. F. Stupart; "Plates and Filters for Monochromatic and Three-colour Photography of the Corona" by J. S. Plaskett; "The Astronomy of Tennyson" by John A. Paterson; "A Lunar Tide on Lake Huron" by W. J. Loudon; "New Variable

Stars, The Variable Star ξ Bootis, The Colours of Helium Stars, A New Problem in Solar Physics" by J. Miller Barr; "On the Possibility of Life in other Worlds" by A. Kirschmann; "Transpacific Longitudes" by Otto Klotz. This was the last of the single yearly volumes of *Transactions*.

Then began "The Journal of the Royal Astronomical Society of Canada." The first number, January-February 1907, contained eighty pages with important contents. In the first paper entitled "Progress in Astronomy and Astrophysics in 1906" was included an account of the Society's work during that year. Reference was made to the sanction by the Council of the proposal to establish branches of the Society at various places in Canada and to the formation of the first one at Ottawa. There is a report of the proceedings at the organization of this section, and the address of Chief Astronomer King on that occasion is printed in full. There is an account of the founding by the Society of a Gold Medal offered annually to the University for competition in Astronomy and Physics, and its first award to W. E. Harper, whose death at Victoria, B.C., in June last brought sorrow to a wide circle of friends. In addition there is a paper on "The Spectrum of *Mira Ceti*" by J. S. Plaskett. It is believed that this is the first publication of scientific research at the new Dominion Observatory, and the frontispiece to this first number is a photograph of the spectrum of this star, taken with the spectrograph attached to the 15-inch telescope by J. S. Plaskett. Plate I is a photograph of the Gold Medal. It may be remarked that the motto on it, *Quo ducit Urania* [*tendimus*], which means "Whither Urania leads, we follow", was chosen from a number offered by Professor John Fletcher of University College. Plate II is a facsimile of a letter from the noted Russian chemist Mendeleeff to J. R. Collins, Secretary of the Society. In addition are reports of observations of aurorae and ball lightning, minutes of meetings, and astronomical and meteorological notes.

Among other papers in the JOURNAL for 1907 is a description of the time service of the Dominion Observatory by R. M. Stewart, which he has since developed into a wonderful system of extreme accuracy; also one on "Some Cosmical Aspects of Radioactivity" by

E. Rutherford. Professor Rutherford came from England in the autumn of 1898 to become Professor of Physics in McGill University and was about to return to England. On April 2 he addressed the Society at a large meeting in the Chemical Building of the University of Toronto, on which occasion Lieut. Governor W. Mortimer Clark was chairman. There are many other interesting articles and notes in the first volume, but they cannot be mentioned here.

The successive volumes of the JOURNAL have never failed to appear, although in times of stress some of the numbers have been late in coming from the press. They have been filled with useful material and many of the articles have been distinguished. It would be unwise to try to indicate those of special value, but reference may be made to a few of wide interest: "Life in Other Worlds" by R. G. Aitken, vol. v, (1911); "Meteorology in Canada" by R. F. Stupart, vol. vi, (1912); "Photographing Lightning" by A. Steadworthy, vol. vi, (1912); "The Genesis of Planets" by P. Lowell, vol. x, (1916); "Astronomy a Cultural Avocation" by A. D. Watson, vol. xii, (1918); "Photographing the Sky" by E. E. Barnard, vol. xvii, (1923); "The Modern Photographic Telescope" by G. W. Ritchey, in vols. xxii, xxiii, (1928, '29).

A PLACE FOR MEETINGS AND A CREDITABLE OBSERVATORY

A glance at the accompanying list of presidents of the Society reveals that the usual tenure of office has been two years, but in the case of the present writer it was four years, 1904-07. At that time the conditions in the life of the Society were unsettled—in a sort of flux. The recent assumption of its honourable and wide-embracing name demanded an attempt to serve more effectively the entire Dominion of Canada. Further, it was in great need of a suitable home, where it could have its office and library and could hold its meetings. About 1902 an approach had been made to Trinity University, then on Queen Street West, to see if a site for an observatory and headquarters for the Society could be obtained on its beautiful grounds, and a letter from Provost Macklem to President Stupart dated May 14, 1903, shows that the proposal had been favourably entertained by the Trinity authorities. Indeed on a landscaped

PRESIDENTS OF THE SOCIETY

1890-94	C. Carpmael	1918, '19	A. F. Miller
1895	Larratt W. Smith	1920, '21	J. R. Collins
1896, '97	John A. Paterson	1922, '23	W. E. W. Jackson
1898, '99	Arthur Harvey	1924, '25	R. M. Stewart
1900, '01	G. E. Lumsden	1926, '27	A. F. Hunter
1902, '03	R. F. Stupart	1928, '29	W. E. Harper
1904-07	C. A. Chant	1930, '31	H. R. Kingston
1908, '09	W. B. Musson	1932, '33	R. K. Young
1910, '11	A. T. DeLury	1934, '35	L. Gilchrist
1912, '13	L. B. Stewart	1936, '37	R. E. DeLury
1914, '15	J. S. Plaskett	1938, '39	W. Findlay
1916, '17	A. D. Watson	1940	J. A. Pearce

CORRESPONDING SECRETARY (1890-1901); SECRETARY (1902-1919); GENERAL SECRETARY (1920 ONWARDS)

1890-99	G. E. Lumsden	1924-27	F. T. Stanford
1900, '01	W. B. Musson	1928-31	L. Gilchrist
1902-17	J. R. Collins	1932-35	R. A. Gray
1918, '19	W. E. W. Jackson	1935-	E. J. A. Kennedy
1920-23	A. F. Hunter		

plan of the grounds a place for the Royal Astronomical Society Observatory was given. But in 1904 Trinity University entered into federation with the University of Toronto and a few years later it moved up to its present beautiful home on the University grounds.

At this time many changes in the University were under way. New buildings were being erected or planned, and the Meteorological Service, which had occupied its site on the University grounds since 1840, was about to move to a more satisfactory location. The present writer proposed to Director Stupart that ten acres or more of land upon the height west of Upper Canada College, in what is now Forest Hill Village, should be obtained, where astronomical and meteorological research might be carried on. This, however, was not acted upon. The handsome new building on Bloor Street was occupied by the Meteorological Office in September 1909.

The facilities for instruction in the practical side of astronomy in the University were wholly inadequate and the writer urged that an effort be made to satisfy the needs of the University and the

Society at the same time. It was proposed that the University supply the Society with a suitable place for its office and library and to hold its meetings; the Society, on its part, would make its library accessible to the University staff and students. It was hoped that suitable instrumental equipment would be secured by the University and that the Society might have access to it at certain times. There was the best of good-will on both sides but no satisfactory solution could be reached. Even now the University has not a satisfactory students' observatory.

Sometime in 1914, probably in the spring, the present writer one evening made a visit to the hospitable home and office of Dr. A. D. Watson, at 10 Euclid Avenue. He was then First Vice-President of the Society, and the object was to discuss with him the question of securing a creditable astronomical observatory. We outlined a project which would involve the City of Toronto, the University, and the Society. According to it the City would supply the site and maintain it as a park; the University would provide the technical staff; while the Society would maintain its library at the service of the public, and would be given accommodation for its meetings. We knew of a suitable site which the City possessed; and, as to the erection and equipment of the buildings, we thought private funds could be secured for the purpose.

The war came on and an appeal for financial assistance had to be deferred. But we did not simply sit down and do nothing. We went to a distinguished architect and explained our project. The present writer described and roughly sketched what accommodation would be required, and our friend, without expense to us, worked out our ideas and had sketch plans drawn of the elevations and of the floors of the proposed building. These plans bear the date July, 1915. This was done to await the opportune time. But the war continued and hope was deferred. However, the writer had three lantern slides made of the plans and on any suitable occasion he would throw them on the screen, at the same time giving an outline of the project.

After the war, in 1919, a deputation explained the scheme to the Board of Control and the City Council, as well as the heads of the City Hall departments chiefly concerned. The proposal was approved

and the City entered into an agreement to supply the site and maintain it as a park. The funds, however, were not in sight.

Two years later, in May 1921, a lecture was given by the present writer on Winnecke's Comet, which was soon to visit the earth, possibly to collide with it, and at its close the observatory slides were exhibited and an appeal made for support for the project. In the audience was David A. Dunlap, who, after the meeting was ended, made himself known to the lecturer. Mr. Dunlap was elected a member of the Society on October 4, 1921. This incident undoubtedly led to the erection of the observatory which bears his name and which is a noble monument to his memory. It was officially opened on May 31, 1935.

THE FOUNDING OF THE TORONTO MAGNETIC OBSERVATORY AND THE CANADIAN METEOROLOGICAL SERVICE

By A. D. THIESSEN
Librarian, Meteorological Office, Toronto

(With Plates XIII-XVI)

INTRODUCTION

WRITING in 1837, Major Edward Sabine, R.A., F.R.S., stated that the subject of terrestrial magnetism has every claim upon the country of Great Britain, because "the existence of four governing centres, and the system of the phænomena in correspondence therewith, was originally a British discovery. The sagacity of our countryman Halley was the first to penetrate through the complexity of the phænomena, and to discern what is now becoming generally recognized. England was also the first country which sent an expedition expressly for magnetic observation, namely, that of Halley in 1698 and 1699. Whilst approving and cordially co-operating in magnetic inquiries of other kinds which have their origin in other countries, it is right that we should feel a peculiar interest in that in which we have ourselves led the way, especially when its object is subordinate to none."[1]

Inspired with the belief that "the magnetism of the earth cannot be counted less than one of the most important branches of the physical history of the planet we inhabit," he felt "quite assured, that the completion of our knowledge of its distribution on the surface of the earth, would be regarded by our contemporaries and by posterity as a fitting enterprise of a maritime people; and a worthy achievement of a nation which has ever sought to rank foremost in every arduous undertaking."[2]

In 1833 the British Association for the Advancement of Science

[1]British Association for the Advancement of Science. Report of the seventh meeting . . . held at Liverpool in September 1837. London, 1838. Vol. 6, p. 85.
[2]Ibidem, p. 85.

had passed a resolution "recommending that a series of determinations of the magnetic dip and intensity should be executed in various parts of the United Kingdom;"[3] and the results were published by Edward Sabine in the eighth report of the Association, 1838. Until this time, however, "the part that Britain had taken in these investigations was limited to the partial and desultory exertions of individual zeal."[4] France and Russia, Germany and Italy, had formed public establishments for the purpose of conducting research on principles of uniformity with respect to methods, instruments, and times of observation. "In 1836 the attention of British philosophers was specifically drawn,—by a letter from the Baron Alexander von Humboldt to His Royal Highness the Duke of Sussex, President of the Royal Society,—to the claims which magnetic science must be considered to have on a nation possessing such extensive dominions in all parts of the globe, and such unrivalled means of contributing to the advancement of the physical sciences, by the formation of suitable establishments in the localities in which researches might best be carried on."[4]

Baron von Humboldt's challenge was accepted. In 1837 the University of Dublin voted funds for the establishment of an observatory and the British Government allotted a site for a magnetic observatory at Greenwich. In 1838 the British Association memorialized the British Government on the subject of "the system of simultaneous magnetic observations which have been for some time carrying on in Germany and various parts of Europe, and the important results to which they have already led," and stated "that they consider it highly desirable that similar series of observations, regularly continued in correspondence with, and in extension of, these should be instituted in various parts of the British dominions."[5] The recommendations of Baron von Hum-

[3]B.A.A.S. Report of the eighth meeting . . . held at Newcastle in August 1838. London, 1839. Vol. 7, p. 49.

[4]SABINE, EDWARD. Observations made at the magnetical and meteorological observatory at Toronto, in Canada. London, 1845. Vol. 1, p. 10.

[5]B.A.A.S. Report of the ninth meeting . . . held at Birmingham in August 1839. London, 1840. Vol. 8, p. 31.

boldt, Major Edward Sabine, the President of the Royal Society, and the Committee of the British Association for the Advancement of Science, were adopted by the British Government, and in 1839 four expeditions were prepared.

The stations named by Sabine and recommended by the British Association were "Canada and Van Diemen Island, as approximate to the points of the greatest intensity of the magnetic force in the northern and southern hemispheres; St Helena, as approximate to the point of least intensity on the globe; and the Cape of Good Hope, as a station where the secular changes of the magnetic elements presented features of peculiar interest. It was also suggested, that the observations at these stations should include meteorological as well as magnetical phenomena."[4]

As the observatory at Hobarton, in Van Diemen Island, was established at a time when a naval expedition was also employed in making a magnetic survey of a portion of the southern hemisphere, it appeared desirable to place it under the Admiralty and draw its personal establishment from the Royal Navy, while the other three observatories were placed under the Ordnance Department, and it was arranged to have their duties performed by officers and soldiers of the Royal Artillery.[5] The officers thus selected were Lieut. (since Captain) Frederick Eardley Wilmot for the Cape of Good Hope, Lieut. (since General Sir) John Henry Lefroy for St Helena, and Lieut. Charles James Buchanan Riddell for Canada. Lieut. (since Commander) Joseph Henry Kay, R.N., was in charge of Hobarton Observatory.

The instructions these officers received were to "carefully observe, and carry into execution, the instructions they would receive direct from the Master-General, or through Major Sabine; and to report to the Master-General monthly their proceedings in the execution of the duties they were employed on, transmitting their reports through the Deputy Adjutant-General."[4] Each

[5]SABINE, EDWARD. Observations made at the magnetical and meteorological observatory at Hobarton, in Van Diemen Island and by the Antarctic Naval Expedition. London, 1850. Vol. 1, p. ix.

officer was to be assisted in his work by three non-commissioned officers, and two gunners, one of the latter to act as an orderly, and the other as the officer's servant. Extra pay was provided for both officers and men, and a sum not exceeding £100 was allotted for each observatory, to meet incidental expenses of all kinds, including the purchase of such new instruments as might from time to time be required. The total charge for each observatory thus amounted to £392 a year.[4] This sum, it will be seen from what follows, was not enough in Toronto, the expenses involved in the operation of the new photographic equipment alone bringing the costs near the limit of £100 a year. Frequently the director in Toronto was compelled to borrow money at the end of the fiscal year in order to be able to carry on.

Although the British Association offered a grant of £400 for the purchase of instruments, none of it appears to have been used for that purpose as "the Government has charged itself with the entire expense of the instruments for the expedition, and for the observatories, under the direction of its own officers."[6] Most effective use was made, however, of this grant, in ordering instruments "in the absence or in anticipation of distinct official authority to do so, and thereby to save much precious time, which, on the present occasion, has been hardly less valuable than money."[6, 7]

It was originally intended to establish the Canadian observatory at Montreal and on September 1, 1839, Lieut. Charles James Buchanan Riddell, R.A., left his detachment of three non-commissioned officers and two gunners with their families (two women and five children) and between forty and fifty packages containing instruments (measuring eight or ten tons in weight) for the observatory, to embark in the Prince George freightship bound for Quebec, while he himself set sail on a faster boat bound for New York. Lieut. Riddell arrived in Montreal on September 28, while the detachment did not land in Montreal until November 1, 1839.[8]

His first business was to select a suitable site and arrange for the

[6]B.A.A.S. Report of the ninth meeting . . . held at Birmingham in August 1839. London, 1840. P. 42.

[7]For a complete description of the instruments used in the Toronto Magnetical and Meteorological Observatory see pp. iii-lxx of reference [4] above.

[8]See letter below, dated Toronto, November 12, 1839.

accommodation of his party and the safe conveyance of the instruments. The following letters will tell their own story.

The Letters

The original records and registers of magnetical and meteorological observations taken at the Toronto Observatory during the years 1839 to 1853, as well as copies of official letters written by the directors of the observatory during those years and a collection of original letters from Captain J. H. Lefroy to Colonel Edward Sabine, R.A., Superintendent of Observatories, were recently discovered in the attic of Kew Observatory by Dr F. J. W. Whipple and forwarded by him to Toronto. Many of these letters throw interesting light on some of the problems of the early directors and it has therefore been decided to publish a selection of them for the benefit of those who may be interested in one of the oldest of the institutions of Toronto, and Canada.

Part I.—Montreal is Found to be Unsuitable as a Site for a Magnetic Observatory. The Observatory will be Established in Toronto.

(Letters, September 30, 1839, to October 18, 1839.)

Montreal, September 30, 1839.

Sir

I have the honor to transmit herewith according to your request the accompanying plan and section of the Magnetic Observatory ordered to be established in this country. The dimensions are those given to me by Professor Lloyd by whom all the instructions relating to the system of magnetic observations have been prepared.

The building must be of stone (brick being magnetic and therefore objectionable). The walls to be about two feet thick and plaistered inside and with double windows, in order to keep a uniform temperature and if possible to obviate the necessity of warming the room containing the magnetic instruments. The pillars of masonry (six in number) to support the instruments, should be about two feet square or in diameter and three feet high above the floor, with which they must be entirely unconnected. Their position can not be exactly determined until the arrival of the instruments. An outer porch will be required projecting three or four feet. An opening with a sliding shutter must be made in the roof over the transit instrument.

I have also to request that should it be found that quarters can not be pro-

vided sufficiently close to the observatory both for myself and party (it being essential that I should be immediately at hand to observe the instruments during sudden thunderstorms, auroras, etc.), Two wooden cottages may be erected one for myself and the other to contain three non-commissioned officers and one gunner with his family.

I have the Honor to be
Sir,
Your obedient Servant
(Signed) C. J. B. RIDDELL
Lieutenant
Royal Artillery[9]

Lieutenant Colonel Oldfield
Commanding Royal
Engineer
Montreal.

Montreal, October 2, 1839.

Sir

In reference to your letter of yesterday's date I have the honor to state that I have decided upon the Island of St Helen's as a site for my observatory. I have also to request that in consequence of lateness of the season and the little chance there appears of a stone building being completed before its close, that the observatory may be erected with logs boarded outside and plaistered within.

I have, etc.
C. J. B. R.
. . .

Lieutenant Colonel Oldfield
Commanding Royal Engineer
Montreal.

Montreal, October 4, 1839.

No. 1. MONTHLY REPORT TO THE DEPUTY ADJUTANT GENERAL

Sir

I have the honor to report my arrival here on the 28th September. Finding that a spot on the Island of St Helen's was the only ground belonging to the Ordnance at Montreal well suited for the site of a magnetic observatory, I have made application to the Commanding Engineer to erect a building thereon, according to a plan with dimensions furnished by Professor Lloyd. I have also requested that quarters may be provided for me adjoining the observatory, the barracks being too far distant to be available.

I have, etc.
C. J. B. R.
. . .

The Deputy Adjutant General . . .

Montreal, October 4, 1839.

Gentlemen

I have the honor to inform you that the hill in the centre of the Island of St Helen's is the only site or ground belonging to the Ordnance at Montreal suited

[9]In the following letters this signature will be abbreviated.

for a magnetic observatory. I have therefore to request your approval of its being built there, and to state that it will be necessary to cut down a considerable number of trees in its immediate vicinity. As the barracks will be too far distant from the observatory to serve as quarters for myself, it being necessary that the instruments should be observed during sudden storms, etc., I have the honor to request your approval of a cottage being also built adjoining it.

I have, etc.

C. J. B. R.

The Respective Officers
Head Quarters
Montreal.

. . .

Montreal, October 4, 1839.

Gentlemen

I have the honor to request that the storekeeper at Quebec may be directed to make the usual application for the conveyance and transport by steamer to Montreal of a party consisting of three non-commissioned officers and two gunners with their families (two women and five children) and between forty and fifty packages containing instruments, etc., for the magnetic observatory to be established here, directed to Lieut. Riddell, R.A., Montreal. The party were to embark in the *Prince George* freightship and may be expected to arrive immediately, and I am desirous that they should be enabled to leave Quebec by the first opportunity after their arrival.

The Respective Officers
Head Quarters, Montreal.

C. J. B. R.

. . .

Montreal, October 14, 1839.

Sir

From information I have received from Captain Bayfield, R.N., Commanding Surveying Schooner *Gulnare*, I consider it necessary to ascertain by experiment after the arrival of my instruments, that the proposed site of the magnetic observatory is free from all magnetic influences, I therefore beg leave to request that any operations with regard to building the observatory may be suspended for the present.

I have, etc.

The Commanding Engineer
. . .

C. J. B. R.

. . .

Montreal, October 17, 1839.

Sir

I beg leave to state that from the information I have received from Captain Bayfield, R.N., Commanding Naval Surveying Service in Canada, with regard to his observations for variation, and as to the nature of the rock formation in the

Island of St Helen's and at Montreal, and generally along the whole line of the St Lawrence, I am led to conclude that the Island of St Helen's would not be an eligible situation for the magnetic observatory from the local attraction which has been observed in its immediate vicinity. The same cause also applies to the neighbourhood of Montreal.

I am however of opinion, founded on Captain Bayfield's information, that Toronto must be free from such influences, and I therefore beg leave to request instructions may be given to the Commanding District Engineer at Toronto for the erection of the observatory and quarters for myself and party should they be required according to the plan of specifications already prepared.

As the season is so far advanced I beg leave also to request that Colonel Ward may be authorized to construct the building either by public or private contract or otherwise as he may deem most advantageous, as the magnetic observations are to be carried on for three years simultaneously with those made by a naval expedition, it is of great importance that the observatory should be completed this year if possible.

I have, etc.

Lieut. Colonel Oldfield
Commanding Royal Engineer

C. J. B. R.

• • •

Montreal, October 18, 1839.

Gentlemen

I have the honor to state that, having ascertained that the Island of St Helen's would not be an eligible spot for a magnetic observatory nor any other situation in the neighbourhood of Montreal, I have applied to the Commanding Engineer for the erection of the observatory and quarters for myself and party (should it be necessary) at Toronto.

I therefore beg leave to request that an application may be made for the conveyance to Toronto of a detachment consisting of three non-commissioned officers, two gunners and drivers, two women and five children together with about forty-eight cases of instruments, etc., measuring about eight or ten tons, intended for the use of the magnetic observatory.

As the season is so far advanced that it is essential to the completion of the building this year that the copper fastenings, etc., accompanying the instruments should arrive early, I beg leave to request that the Storekeeper may be directed to make the requisition immediately without waiting for the arrival of the party in order that they may proceed with the least possible delay. I have also to request that in case the navigation of the Rideau Canal is closed before the arrival of the instruments, a requisition may be sent in for them to be forwarded by bateau up the St Lawrence to be towed where it is possible by the steamer.

I have to request that copies of all letters from the Secretary of the Board relating to the magnetic observatories may be sent to the Respective Officers at Toronto.

I have, etc.

The Respective Officers
Head Quarters, Montreal

C. J. B. R.

. . .

Part II.—From Bathurst Street Barracks to King's College
(Letters, October 1839 to September 1840.)

The life of the early directors and observers in the Toronto observatory (as well as at the other observatories) was that of officers and soldiers in garrison, and for nearly a whole year the observations were taken in an unused barracks of Old Fort York on Bathurst Street. Even after the observatory building on King's College grounds was completed, the military system prevailed. "The officers and men stationed at the observatories," writes Colonel Sabine (see reference [4] above), "were on the spot in the respective colonies, should an emergency occur in which their military services might be required." It will be remembered that there had been an insurrection in Canada, led by the first mayor of Toronto, William Lyon Mackenzie, in 1837; and the possibility of further outbreaks of this kind was considered. At the Cape of Good Hope in June 1842, Captain Wilmot was ordered to take the garrison duty of his corps during an insurrection of the Boers at Port Natal, but in none of the other observatories did any instances of this nature occur.

A letter written by Captain J. H. Lefroy to Lieutenant Colonel Sir Charles Chisholm, Commanding the Garrison, on November 27, 1846, on an occasion of minor significance, describes the position of an Officer in charge of an Observatory quite clearly:

Magnetic Observatory, November 27, 1846.

My dear Sir

In reply to your note of this day, I beg leave to say that my position in Toronto is that of an officer on special service, and that I am not available for military duty except under special circumstances, when the Officer Commanding the Royal Artillery in the Canadas is authorized to require them of me. In a minute from the late Master General Sir George Murray dated 28th April, 1845, it is directed, that "in the event of any circumstances occurring at a foreign station, under which it shall appear to the commanding officer of artillery on the station that the urgency of the public service requires the temporary withdrawal of any of the officers or soldiers of the Royal Artillery from the magnetic observations, to the discharge of military duties, he is authorized (upon his own responsibility) so to withdraw them, reporting the circumstance for the information of the Master General in the usual manner." This limits my general liability to military duty to cases of urgency, and I do not apprehend that I am liable to Courts Martial, or to any other regimental or garrison duties. I have nothing

to do with the detachment of artillery at the Fort, they do not report to me, nor do I, I conceive, come within the scope of garrison orders, as such. I have however been occasionally called upon by the officers commanding at Kingston to act as an officer of the regiment in trifling matters which required the presence of one, and last year, for the first time, I was directed to apply to the officer commanding the troops for a Captain as President of a Board of Survey, "yourself and Lieut. Younghusband being the members", and this was done. Upon all previous occasions the board was composed of officers of the regiment in garrison. It was I believe the only occasion in which the officers here have been recognized in orders. It serves as a precedent, and I imagine Colonel Dalton will expect my presence at the Board for the future, although his predecessors in the command at Kingston did not. The proceeding is a little anomalous, as may be expected some times to occur under the partly civil, partly military circumstances of our position here, but I am very happy to perform any military duty consistent with the duties of the observatory, and therefore raise no question on the subject. I am of course liable to receive orders from the Commanding Officer at Kingston, being home on the strength of his command, and on all military matters, communicating through him.

Believe me yours very truly,

J. H. LEFROY.

Lieut. Col. Sir George Chisholm
Commanding the Garrison.

It is natural that under these conditions, Lieut. Riddell should look for a site first in the vicinity of the Fort where the garrison was stationed. That other considerations, in which concern for the future of scientific investigation outweighed all others, should have become decisive, bears fine testimony to the wisdom of the men who established the Observatory and handed on to the Province of Canada, in 1853, a tradition which it has been the pride of the Service to honour and uphold. For the affiliation with the University, under whose auspices much of the work has been done, has from the beginning been a happy one, ensuring in 1853 the permanence of the establishment, and providing always the stimulus of active and productive research.

Toronto, October 24, 1839.

Sir

Upon my arrival this day I waited on Colonel Ward and found that he had only received authority from you to build a single apartment 50 feet by 20, as a copy of my letter to you of the 30th September with authority to act thereon had not been forwarded to him. As the season is so far advanced that a delay of a few days may prevent the possibility of the building being completed this

year, I beg leave to request that you will have the goodness to transmit the necessary authority to Col. Ward to build the observatory and cottages adjoining, as requested in my letter of the 30th September acceompanied with the plans of specifications prepared by Major Foster.

I have, etc.

C. J. B. RIDDELL . . .

Lieut. Col. Oldfield
Commanding Royal Engineer
Montreal

Toronto, November [?], 1839.

My dear Sir

I shall be obliged if you will inform me for what rent you will let me have your cottage for the winter, and also in case it should be required one of the two upper cottages for my men. I should also be glad if you tell me whether you would be willing to give a lease of the lower cottage for 3 years with a power of renewal for another term of the same period, and at what rent. The house would require to be white washed, painted and probably one or two alterations and some fixtures such as stones let into the chimneys for stoves, etc., would be necessary, and also the ground about it to be enclosed with a good fence say 90 to 100 feet square. I shall want a stable and place for a wagon and sleigh also to hold a certain quantity of forage, etc. The chimneys, I understand nearly all smoke. Some alteration would therefore be necessary of them. I should be glad if you will give me an answer to this as soon as possible as it will occasion an alteration in my plans which if made at all must be made at once.

Believe me yours truly,

C. J. B. RIDDELL

Dr Gwynne[9]

[See letters dated November 14, 1839, and August 25, 1840, below.]

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[9]William Charles Gwynne, M.B., b. 1806, d. 1875. Dr. Gwynne was born in Ireland and was educated in Trinity College, Dublin, and also at Edinburgh. After taking his degree in 1832 he came to Canada as surgeon on board a sailing vessel and was admitted to the practice of medicine in Upper Canada on July 9, 1832. He was surgeon to one of the regiments of the militia during the rebellion of 1837. He was chosen professor of anatomy and physiology when the Medical Faculty of King's College was organized in 1843.

The cottage mentioned in this letter is described and pictured in Robertson's "Landmarks of Toronto," Toronto, 1898, vol. 3, pp. 13-14: "It resembles an Indian bungalow in appearance and in its interior arrangements. It was built by Dr. Gwynne . . . and is of mud brick, the walls being nearly two feet in thickness. The front door opens into a spacious reception hall, and four doors open into different rooms. On three sides of the cottage is a wide verandah, and the view over the lawn on the south side looking on to the lake is a very lovely one." It was on the west side of Bathurst street and about 300 yards north from the lake.

Toronto, November 12, 1839.

Gentlemen

I have the honor to report the arrival at Quebec on the 1st instant of a detachment placed under my orders consisting of three non-commissioned officers and two gunners and drivers to assist in making magnetic observations. They will probably arrive here on the 15th or 16th instant. I have the honor to request that they may be provided with quarters in the vacant barracks in Bathurst Street until quarters are procured near the proposed observatory. I also beg leave to request that I may be allowed the use of three rooms at the south of the barrack in order to set up some of my instruments and make some observations which will be required before the observatory can be built. For which purpose I have also to request permission to fix the wooden supports of the instruments to the floor or sides of the building.

I have, etc.

C. J. B. R.

The Respective Officers
at Toronto.

Toronto, Upper Canada
November 14, 1839

Sir

I have the honor to report that on the 13th of last month I received a letter from Captain Bayfield, R.N., Commanding Naval Surveying Service in the Canadas, in answer to one written by me on my arrival at Montreal, in which he stated several particulars, more especially some observations of his own for variation, which pointed out the presence of considerable local attraction in the neighbourhood of the Island of St Helen's and of Montreal generally. Upon hearing this I immediately proceeded to Quebec to see and consult Captain Bayfield upon the nature of the other parts of the country, when he strongly recommended me to establish the observatory at Toronto, which he considered must be perfectly safe from local attraction, or at all events more likely to be so than any part of the country below it. As I had been informed by Major Sabine, it was the opinion of the gentleman by whom Montreal was originally named to Government, that there were no scientific considerations which should preclude the exercise of my discretion in the selection of another locality should unforseen difficulties be found in the establishment of the observatory at Montreal.

I considered it would be advantageous to the Service to proceed without delay to Toronto and I have the honor to report my arrival here on the 24th of October.

On my arrival at Montreal I found that the orders to the Commanding Royal Engineer to build the observatory, transmitted to me by Colonel Fox, directed the erection of a single apartment 50 feet long by 20 instead of a building 50 by 30 ceiled and plaistered with partitions, as applied for by Major Sabine and ordered by the Board. I informed Colonel Oldfield, Commanding Royal Engineer, of the mistake, when he stated that "if I would write him a letter specifying what was required, he would recommend its being authorized by the Commander of

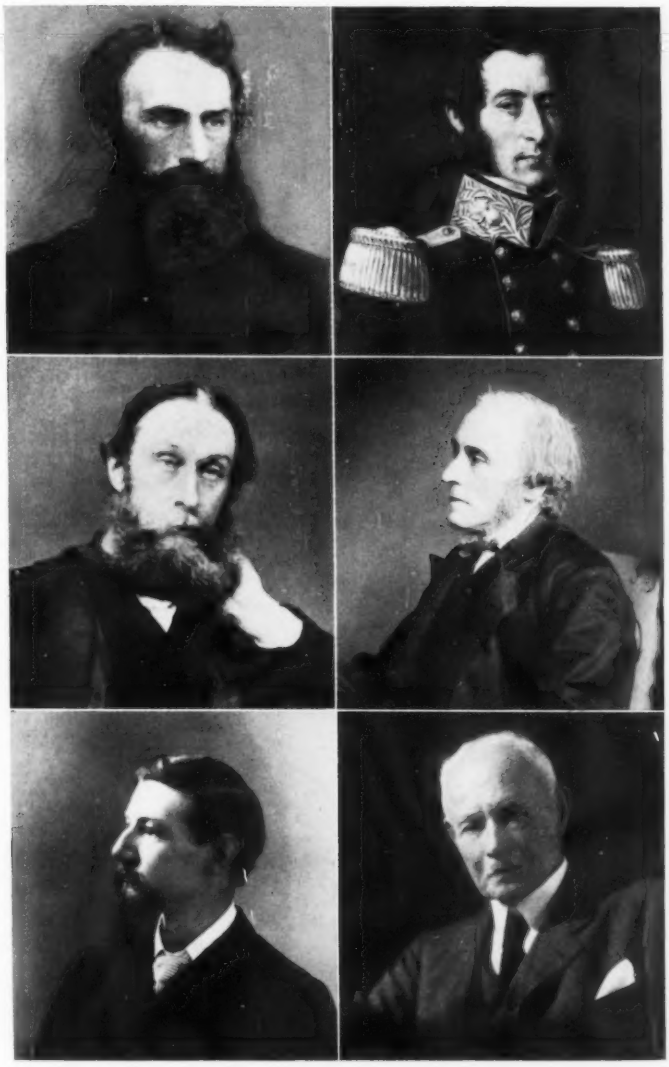
the Forces." This letter dated 30th September I forwarded immediately, accompanied by a plan of the building, and requesting "that if it should be found that quarters can not be provided sufficiently close to the observatory both for myself and party, two wooden cottages may be erected one for myself and the other to contain three non-commissioned officers and one gunner with his family."

I also furnished Colonel Oldfield, at his own request, with a copy of the letter from Colonel Fox to me, transmitting the above mentioned letter to the Commanding Royal Engineer, and which it stated "instructed him to render me such assistance as his department would afford in preparing buildings for the magnetic observations to be conducted under my directions."

My letter was sent soon after to the District Engineer at Montreal. Plans and specifications for the observatory and a cottage for myself were drawn out and approved of by Colonel Oldfield and tenders were advertised for by the Commissariat, some were received and on the 13th I received the letter before mentioned from Captain Bayfield, R.N. On the 17th, immediately after my return from Quebec, I wrote to Colonel Oldfield requesting the necessary authority for the Commanding Engineer at Toronto to proceed with the required buildings and pointing out the importance of having the observatory commenced immediately. A copy of an extract of this letter is annexed, marked No. 2. I also spoke privately to Colonel Oldfield on the same subject as I had frequently before done. To be the more certain of no delay occurring from the necessary authority not being transmitted, I enquired at the Royal Engineer Office and was informed that all the letters transmitted to the District Engineer at Montreal had been enclosed by Colonel Oldfield and forwarded to Lieut. Colonel Ward, Commanding Engineer at Toronto. Colonel Oldfield being absent I could not learn it from himself. On arriving at Toronto I found that the only authority received by Colonel Ward was a copy of the letter to the Commanding Engineer directing the erection of a single apartment fifty feet by twenty. I immediately (on the 24th) wrote again to Colonel Oldfield requesting as before the necessary authority for Colonel Ward to proceed with the buildings that might be required, and stating that "as the season was so far advanced a delay of a few days might prevent the possibility of the building being completed this year". Ten or twelve days afterwards I received an answer directing me to "make known my wants to Lieut. Colonel Ward" who was ordered to report them to Colonel Oldfield.

As soon as I could select a site for the observatory I furnished Lieut. Colonel Ward with a detail of the buildings required, which consisted of the observatory and two cottages as requested in my first letter to the Commanding Engineer. This he forwarded to the Commanding Engineer at Montreal on the 31st October. Soon after this I pointed out another site (also on the Military Reserve, preferable to the former one). Having the advantage of being near a cottage in which I could live for the winter, and thereby be enabled to commence observations the moment the observatory was ready. It seemed also to be dry and healthy whereas the other was the reverse. Soon after my arrival at Montreal, finding that it would be impossible to get a stone building finished, I deemed it most advantageous to request the observatory should be built of logs finished in the

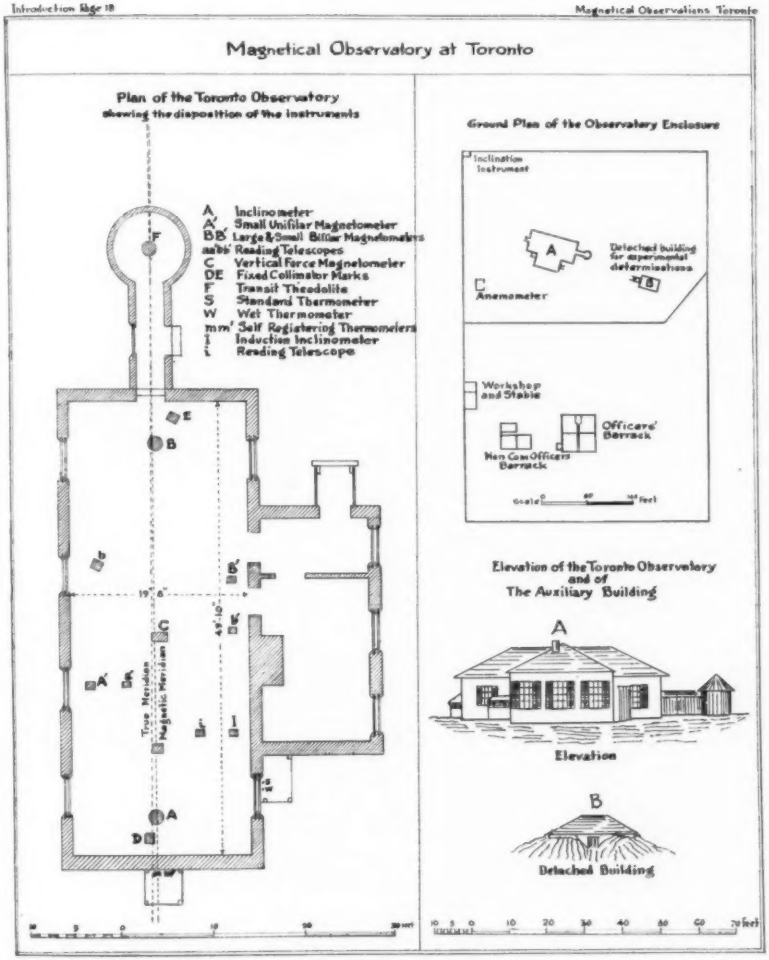
PLATE XIII



Successive Directors of the Meteorological Service:

Lt. C. J. B. Riddell, R.A., 1839-1841.
Prof. J. B. Cherriman, M.A., 1853-1855.
C. Carpmael, M.A., F.R.S.C., 1880-1894.
Capt. J. H. Lefroy, R.A., 1841-1853.
Prof. G. T. Kingston, M.A., 1855-1880.
Sir Frederic Stupart, F.R.S.C., 1894-1929.

Journal of the Royal Astronomical Society of Canada, 1940.

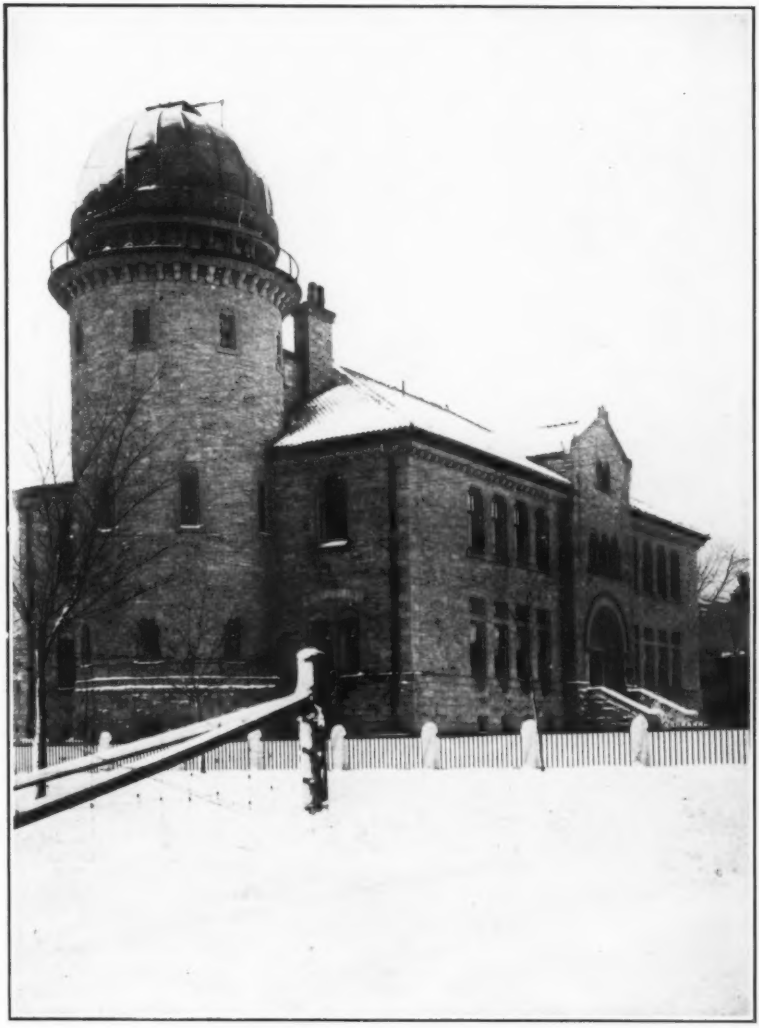


Plan of the Magnetical Observatory at Toronto, 1840-1854, from drawings by Lieut. Younghusband, R.A., as reproduced in E. Sabine, *Observations made at the Magnetical and Meteorological Observatory at Toronto*—Vol. I, p. 18, 1845.

PLATE XV

Upper: View of Old Fort York from the east. The Magnetic Observatory was located in one of the unused barracks.
Lower: Magnetic Observatory 1840-54.

PLATE XVI



Headquarters for the Meteorological Service since 1909.

Journal of the Royal Astronomical Society of Canada, 1940.

warmest manner. The same alteration I found to be necessary here, the season being too far advanced to be even sure of a stone foundation being built.

Plans and specifications were drawn out and tenders advertised for, to be received on the 15th instant, provided the authority had been received for accepting them.

I have this day (14 Nov.) received a letter from Lieut. Colonel Ward (annexed and marked No. 4) transmitting a copy of a minute of the Commanding Royal Engineer pointing out a position in the neighbourhood of the Fort which, for the reasons herein stated, he considered more eligible than the one selected by me and where unless there could be some strong objection not known at Montreal the observatory should be erected.

This position I had before mentioned to Lieut. Colonel Ward as objectionable, and although I regretted very much the additional delays that must arise, my objections against it were so strong that I felt that I should not be justified so long as I remained responsible for the selection of the site in allowing the observatory to be built thereon. I beg leave to request your perusal of the accompanying copy of a letter from me to Lieut. Colonel Ward dated 14th November in whch I have stated some of the objections I felt towards the site proposed by Colonel Oldfield, as well as the advantages attendant upon the other. I have also to report that I have transmitted a copy of the same letter, with a portion of the above statement, to the Military Secretary of the Commander of the Forces, requesting that should His Excellency approve of the site selected by me, he will be pleased to authorise and instruct the Commanding Royal Engineer to proceed immediately with the erection of the observatory and quarters for myself and party according to plans transmitted by Colonel Ward.

With reference to the opinion expressed by me in my letter to Lieut. Colonel Ward with regard to quarters for myself and party in the Fort, I may add that the ordinary forms of a garrison would alone occasion great inconvenience and delay in passing to and from the observatory at night, especially as the gate leading to it would not be the one used as an entrance, and to go round by the other would cause a considerable circuit over a very bad road and through the artillery stables, the gates of which are locked at night. In the event of a repetition of the last years' outbreaks these considerations would deserve still more weight.

I have deemed it necessary to trouble you with this lengthened detail as well as to transmit the annexed copies of letters from me, in consequence of the delays that have taken place and are likely yet to continue in the erection of the observatory, and I beg leave further to state that I was not aware when I reported my arrival to His Excellency Sir John Colborne (who was pleased to offer "any authority the Engineers might require") what were the orders received by the Commanding Royal Engineer. The illness of His Excellency prevented my seeing him for a few days subsequently, and as Colonel Oldfield had informed me that he should take my letter to the Military Secretary and recommended its being authorised, and he had afterwards ordered and approved of the plans, etc., drawn out upon it and sent to the Commissariat, I did not suppose that any

further application on my part for authority could be necessary. Had I been aware that the orders given to the District Engineer at Montreal would not be transmitted to Lieut. Colonel Ward as requested in my letter of the 17th October (of which a copy is annexed) but instead a letter which I had informed Colonel Oldfield was useless as authority, I should have remained at Montreal until the arrival of the Commander of the Forces from Quebec would have enabled me to obtain the necessary authority and instructions to the Commanding Engineer at Toronto to proceed immediately with the erection of the buildings.

I have the honor to report the arrival of the detachment under my orders at Quebec on the 1st November after a passage of 57 days during which a portion of the cargo was thrown overboard to lighten the ship.

I have, etc.

C. J. B. R.

The Deputy Adjutant General
Royal Artillery, etc., etc., etc.

Letters transmitted with the original of the above: To the Commanding Engineer dated 30th Sept., 17th Oct., and 24th Oct. From Lieut. Col. Ward dated 14th November. To Lieut. Col. Ward dated 14th Nov.

Toronto, November 14, 1839.

Sir

In reply to your letter of this day's date, transmitting a copy of a minute of the Commanding Royal Engineers in the Canadas.

I have the honor to state that I consider the position pointed out by Lieut. Colonel Oldfield as objectionable for the site of the magnetic observatory from its contiguity to the Fort, and from its being part of the drill ground of the troops, where during the summer months there would be frequent firing both of artillery and musquetry. The number of meteorological instruments which must be placed outside the observatory, as well as an apparatus for atmospheric electricity which is expected in the following year, also the experiments and observations that will be required to be made in its vicinity, are all strong reasons against placing the observatory in the immediate neighbourhood of a garrison of seven or eight hundred men.

The position I first pointed out to you was selected on account of its being the most favorable ground with the *nearest distance* to the main road of any I could select, and requiring very little cleaning, there being only a light brush wood on the ground. The only objection appeared to be its unhealthy position in the midst of swamps and its inconvenient distance from the town, but I considered it my duty to select it, the proper position for the observatory being the first point to be considered, other situations which I desired to fix upon were to be within (or nearly) one hundred yards of the proposed Fort.

Finding that the swamps in the neighbourhood were worse than I had at first imagined and likely to be very unhealthy, and that even if the observatory were finished the quarters adjoining it would not be fit to live in until the spring.

Upon being offered the hire for the winter of a small cottage situated near the edge of the military reserve, I selected another spot in its vicinity, near the concession road, rather farther from the main road than the former and at a very inconvenient distance from the town (about two miles) but where I should be enabled by living in the cottage to commence observations the moment the observatory was finished, which I could not do on any other part of the reserve except near the Fort, which from the first for the reasons stated above (and which I believe that I mentioned to you in our first conversation on the subject) I considered objectionable. This I considered a most important recommendation and therefore applied to you to build the observatory on that site.

I am also of the opinion that this position is one of the best adapted for a meteorological or other observatory, as well as the driest and healthiest of any in the neighbourhood, which induces me still to recommend that the observatory should be built there.

With regard to quarters for myself and party which have been ordered by the Board to be provided in the immediate vicinity of the observatory, I do not consider that the duties with which I am charged could be properly performed, requiring as they frequently would, in addition to the regular series of observations day and night, casual observations during sudden phenomena, etc., if I were living with my party in the Fort, the observatory being outside in the position pointed out by Colonel Oldfield.

The only additional expense attendant upon the site selected by me would therefore be for the construction of a road, towards which the proprietor of the neighbouring property has offered to contribute his share. The clearing required would be so trifling as scarcely to amount to a consideration. I applied to the owner of the cottage before mentioned to know if he would give a lease for three years and at what rent. He demanded £50 per annum and at your desire I wrote to acquiaint him you did not approve of giving that. The cottage is not large enough to hold my detachment, and there is no other, with the exception of an occupied farm house, within more than one-half mile of the proposed site.

In conclusion I have to regret exceedingly the delay that must arise from the necessity of another reference to Head Quarters. But I should not feel justified, while responsible for the selection of a site, to allow the observatory to be built in a place which I consider objectionable without first stating my objections. I need not add that every day's delay in the commencement of the observatory may be of great importance to the objects of the Expedition.

I have, etc.

C. J. B. R.

Lieut. Colonel Ward
Royal Engineers

(No. 1.—*Transmitting copy of letters to Lt. Col. Ward and Master General's letter to Sir John Colborne. Posted on the 16th.*)

Toronto, Upper Canada,
November 15, 1839.

Sir

. . . . . .

I beg leave to add with reference to the opinion expressed by me in my letter to Lieut. Colonel Ward with regard to quarters for myself and party in the Fort, that the ordinary forms of garrison would alone occasion great inconvenience and delay in passing to and from the observatory at night, especially as the gate leading to it would not be the one used as an entrance, and to go round by the other would cause a considerable circuit over a very bad road and thro' the artillery stable yard, the gates of which are locked at night. In the event of a repetition of the outbreaks of the last years these considerations would derive still more weight.

I take the liberty of enclosing an official letter of introduction from the Master General of the Ordnance to His Excellency Sir John Colborne, which I did not receive until after the departure of His Excellency. It will probably explain to his Excellency the Commander of the Forces the nature of the Service I am employed upon. The magnetic observations are simultaneous with those made by a naval expedition (which sailed for the South Seas the end of September) and at the fixed observatories to be established at the Cape, St Helena, and Van Diemans Land.

From the nature of the climate, if the erection of the observatory is not commenced almost immediately, it must be delayed for nearly six months, which would occasion the loss of comparative observations with the stations which might never again be visited by the naval expedition.

I trust that the pressing nature of the case will excuse my taking the liberty of requesting that His Excellency would be pleased to give an early decision as to the site on which the observatory is to be placed.

I have, etc.

C. J. B. R.

The Military Secretary
Montreal

(No. 2.—*Transmitting letter from Treasury to Commissariat dated 14th Sept. Posted on the 18th.*)

Toronto, Upper Canada,
November 18, 1839.

Sir

With reference to my letter of the 15th ultimo, requesting that His Excellency the Commander of the Forces would be pleased to direct that the necessary authority and instructions to be given to the Commanding Royal Engineer to

proceed immediately with the erection of the magnetic observatory and quarters for myself and party on the site I had the honor to recommend. I have the honor to transmit the accompanying copy of a letter from the treasury to the Commissary General dated 14th September authorizing the issue of such sums as may be required for the erection of the "observatory and accomodation for the officer and his department employed on this special service". Owing to the absence of the deputy storekeeper at this station I was not able to see this and other letters which had been forwarded by the Respective Officers at Montreal until this morning.

I have also ascertained from the perusal of those letters that the usual directions have been given to the commissariat department to issue rations to the non-commissioned officers and men to be employed under my orders in making magnetic observations, but omitting to mention the officer and the women and families of the two gunners who were permitted to come out from England with the detachment and in consequence of which a doubt was expressed by the Deputy Commissary General as to his being authorized to issue rations to me without a specific authority.

In a letter from the Secretary to the Board of Ordnance to the Deputy Adjutant General Royal Artillery dated 19th August it is stated that "the Lords of the Treasury have been requested to instruct the Commissariat Department at the several stations to issue rations to the officer, non-commissioned officers, and men about to proceed to carry on magnetic observations" and also "to supply such fuel as might be required for the observatories as well as for the individuals employed." Before leaving England a memorandum was laid before the Deputy Adjutant General Royal Artillery requesting to know if the non-commissioned officers and men of the several detachments about to proceed on the service of the magnetic observatories would be allowed rations for *themselves and families*. When he directed a letter to be written requesting the same, two married men were allowed to be selected for each party and their wives and families have been provided with a passage and the usual rations on board ship. I therefore consider that it must have been the intention of the Master General and Board of Ordnance that they should continue to receive rations in this country. I therefore beg leave to request that His Excellency would be pleased to authorize the issue of rations to the officer, non-commissioned officers, and men, and to the wives and families of two of the men of the detachment to be employed in making magnetic observations from the dates of their respective arrivals at Montreal and Quebec.

I have, etc. C. J. B. R.

The Military Secretary
Montreal

Toronto, Upper Canada,
November 19, 1839.

Sir

I have the honor to report that on looking over the order to the Commissariat respecting the issue of rations to the detachment under my orders, I found that

the order included only the non-commissioned officers and men, making no mention of either the officer or the wives or families of the men who had been allowed a passage with the detachment. Before leaving Woolwich I had the honor of laying a memorandum before you in which amongst other questions was that of whether the non-commissioned officers and men would receive rations for themselves and *families*, and to which you were pleased to answer in the affirmative and to direct that a letter should be written requesting the same. My principal object in requesting the information was with regard to the families, and after my interview with you I informed Lieutenants Wilmot and Lefroy and the men themselves that they were to receive rations. Two married men being allowed for each detachment and their wives and families being furnished with a passage and the usual rations on board ship—with my previous impressions on the subject—made me consider that it was intended that they should continue to receive rations on their arrival in this country. I have in consequence taken the liberty to lay the foregoing circumstances before His Excellency the Commander of the Forces and to request that he would authorize the continuance of rations to the wives and families of two of the detachment. As a doubt was expressed by the Commissariat whether rations could be issued to me on the ordinary notification of my arrival, in consequence of the special order having been received authorizing their issue to the non-commissioned officers and men, and as a letter from the Secretary of the Board to the Deputy Adjutant General, of which a copy has been transmitted, stated that the treasury had been requested to direct the issue of rations, fuel, etc., to the officers, non-commissioned officers, and men employed, I also requested that His Excellency would be pleased to direct the issue of rations to myself as well as to the detachment. Should you be pleased to approve of my application for a continuance of rations to the two families before mentioned, I beg leave to request that you would have the goodness to procure the necessary authority for the issue of rations to the wives and families of two men of each of the detachments employed.

I have, etc.

C. J. B. R.

The Deputy Adjutant General
Royal Artillery

Toronto, Upper Canada,
November 25, 1839.

Sir

I have the honor to transmit herewith a copy of memoranda from Lieut. Col. Oldfield, Commanding Royal Engineer, dated 16th November, which I received on the 23rd ultimo from the Clerk of the Works, Royal Engineer Department, directing that in case I should consider the site named by him ineligible. the observatory should be proceeded with on the site pointed out by me.

As it will be necessary to advertize again for tenders, the building could not possibly be commenced until about the middle of December. The frost has already set in very severely and I am informed by the Clerk of Works, Royal Engineer Department, and others who have had experience of the climate, that

there is scarcely any probability of the weather after that time being such as to allow the stone foundation for the pillars to be built.

I am under the necessity of reporting that I consider that the erection of the observatory must be postponed until the close of the winter, as no dependence could be placed on the steadiness of foundations built so late in the season and while the frost is in the ground. The building may probably be commenced about the end of March or the beginning of April and can then be built of stone as originally intended.

I have also to report that an unoccupied barrack has been given over to me and that I shall request that one of the rooms may be fitted up as a temporary observatory in which I shall as far as circumstances will permit carry on the required series of observations. My detachment will also be provided with quarters in the same building.

I have the honor to report the arrival of my detachment on the 24th ultimo with the whole of the instruments.

In consequence of the remarks made by Lt. Col. Oldfield in the accompanying memoranda and which might seem to imply that there had been an undue interference on my part with regard to the erection of quarters for myself and party, I beg leave to state that at Montreal the plan of the cottage for myself was drawn out without any suggestions even on my part. At Toronto, Lieut. Colonel Ward, having no instructions on the subject, requested me to furnish him with a detail of what buildings were required, which I did, giving the same dimensions for my quarters as I had seen in the plan approved of by Colonel Oldfield at Montreal. With reference also to Lieut. Colonel Oldfield's remarks as to my having twice changed the site of the observatory after tenders had been advertized for, I beg leave to state that the reasons for the change from Montreal to Toronto I have had the honor to lay before you in a former letter. The other can scarcely be considered a change, as I first pointed out to Colonel Ward, only as the probable position in consequence of his wishing to point it out to Colonel Oldfield, stating at the same time that the exact position remained to be determined, which was done before the specifications were completed.

I have, etc.

C. J. B. R.

The Deputy Adjutant General
Royal Artillery

Toronto, Upper Canada,
November 25, 1839.

Sir

I have the honor to state with reference to my former letter on the subject of the magnetic observatory ordered to be established by Her Majesty's Government, that I have received on the 23rd ultimo a copy of memoranda from Lieut. Colonel Oldfield, Commanding Royal Engineer, to Lieut. Colonel Ward or the Senior Officer of Engineers or Clerk of Works at Toronto, dated 10th Nov., directing that in case I should consider the site I had pointed out and which I had the honor to recommend for the approval of His Excellency the Commander of the

Forces. As the building could not now be commenced until about the middle of December and the frost has already set in very severely, there is no longer any probability of the work being performetl in a proper manner until the close of the winter, I have therefore been obliged to postpone the erection of the observatory until that period has arrived.

I have the honor to state further that a part of an unoccupied wooden barracks at this station has been given over to me by the Respective Officers of the Ordnance in order that one of the rooms might be converted into a temporary observatory. The barrack is built of frame work without any plastering, and as it is essential for the correctness of the observations that a uniform temperature should be kept up in the room containing the instruments, I beg leave to request that His Excellency would be pleased to authorize the Commanding Royal Engineer at Toronto to proceed immediately and without requiring the previous transmission of specifications of estimates to Montreal with the following work at the Bathurst Street Barracks at this station, viz., to plaster one of the rooms, affix double windows and shutters, and also to make any additional minor alterations and fittings that may be necessary and the expense of which will be trifling. The observatory cannot be expected to be completed before the end of April; this temporary observatory will therefore be in use for five or six months.

I beg leave further to state that, it being necessary that we should reside in the immediate vicinity of the observatory, my detachment and myself will also be provided with quarters in another part of the same building, which, like the room before mentioned, has no other protection than the rough boarding against the weather.

I have, etc.

C. J. B. R.

The Military Secretary
Head Quarters, Montreal

Toronto, December 5, 1839.

Sir

I have the honor to request that the undermentioned articles may be supplied for the construction of temporary stands, etc., for instruments belonging to the Magnetic Observatory and making an enclosure around them, viz.,

	Number	Length	Diameter
Pickets.....	22	8 feet	8 inches
	15	5 feet	6 inches

	Length	Thickness
Oak Plank	70 ft.	4 inches
Pine "	30 ft.	4 "
" "	50 ft.	1 "
" "	40 ft.	2 "
Shingles	50 ft.	

(The work will be performed as far as possible by the men of my detachment.) A supply of nails, lock and hinges will be required, but as I am not able to give an estimate I beg leave to request that they may be purchased by the Engineer Department and supplied on my requisition, but should the detachment be unable to perform any part of it, I shall have to request that such portion may be executed by hired tradesmen.

I have the honor to transmit an extract from a letter from me to the Military Secretary requesting that authority might be given to plaister and affix double windows and shutters to one of the rooms in the Bathurst Street Barracks on this station to enable it to be used as a temporary observatory and I beg leave to request that the work may be performed as soon as possible.

I have, etc.,

C. J. B. R.

The Clerk of Works
Royal Engineers Dept.
Toronto

Toronto, Upper Canada,
December 7, 1839.

Sir

I have the honor to report with reference to my letters of 14th and 25th Nov. on the subject of the erection of the magnetic observatory that I have received a letter from the Military Secretary to His Excellency the Commander of the Forces acquainting me that the Commanding Engineer has been instructed to accede to my wishes in regard to the site of the observatory and to afford me the required assistance. The alterations required to fit up a temporary observatory for the winter will be completed as soon as possible.

I have also to report with reference to my letter of the 19th November on the issue of rations to myself and to the families of the detachment under my orders, that His Excellency has been pleased to sanction the issue of the usual portion to the non-commissioned officers and men of the party and to observe that "with respect to my being allowed rations there does not appear a doubt, being in command of the detachment."

I have to report further that, with the exception of two thermometers which have been broken on the passage, the instruments have arrived safe and in good order.

I have, etc.

C.J.B.R.

The Deputy Adjutant General, R.A.

Toronto, December 10, 1839.

Sir

In compliance with your request I have the honor to transmit a detail of the work required to be performed at the Bathurst Street Barracks in order to fit up one of the rooms as a temporary observatory, viz.,

To plaister one of the rooms; to affix double windows and shutters to the same; to take up a part of the flooring and drive in five sets of pickets as stands for the instruments; to make an opening in the roof of the adjoining room and set up an anemometer, or instrument for regulating the direction, etc., of the wind.

In addition to the above the materials will, according to a requisition I had the honor to transmit on the 5th instant, be required for making a small shed to contain meteorological instruments, and an enclosure around them and for other minor fittings up. The work will be performed by the men of my detachment. They will also set up the picket stands for the instruments.

I have, etc.

C. J. B. R.

Lieut. Colonel Ward
Commanding Royal Engineer
Toronto

Toronto, December 13, 1839.

Sir

I have the honor to inform you that the following work will be required to set up the anemometer as requested in my letter of the 10th instant, viz., To make an opening in the ceiling large enough for a man to pass through to set up a light support about three feet high above the roof for a cylinder to rest on; to make two small openings in the roof, one about three, the other one inch in diameter, for the tubes to pass through, and to make the roof good around them. It may afterwards be found necessary to secure the vane with cross pieces.

I have, etc.,

C. J. B. R.

Lieut. Colonel Ward
Commanding Royal Engineer
Toronto

Toronto, Upper Canada,
December 18, 1839.

Sir

I have the honor to request that you would have the goodness to furnish me with the keys of the Guard Room and of the Staff Serjeant's Quarters in the Bathurst Street Barracks, that of the first in order that I may remove the stove into the room to be used as an observatory while being plaistered, the other that my servant may occupy it as his room. I have also to request that one 'T' pipe may be issued.

I have, etc.,

C. J. B. R.

The Barrack Master
at Toronto

On December 19, 1839, Lieutenant Riddell wrote to the "Bursar of Upper Canada College" regarding a site for the Magnetic Observatory on property belonging to King's College with the happy result that the permanent observatory was located there. The correspondence regarding this matter is printed by itself in Part III below. See also the letters dated August 25, and 26, and September 22, 1840.

Toronto, December 21, 1839.

Gentlemen

I have the honor to request that the Staff Serjeant's Quarters in the Bathurst Street Barracks, which are now unoccupied, having been vacated for about a fortnight, may be given over to me to be occupied by my servant, as I am very desirous in consequence of the number of instruments that are obliged to be left in the enclosure, and for which reason I request that the Guard might be withdrawn that no person but those of my party should have access to the Barrack enclosure. This is the only room not given over to me.

I have, etc.

C. J. B. R.

To the Respective Officers.
at Toronto

Toronto, January 7, 1840.

Gentlemen

The Guard having been withdrawn from the Bathurst Street Barracks, I have the honor to request that the key of the Guard Room may be given over to me as I wish to place several articles of iron in it, that they may be the greatest distance possible from the magnet in the observatory.

I have, etc.

C. J. B. R.

The Respective Officers
Toronto

Toronto, Upper Canada,
February 20, 1840.

Sir

I have the honor to report that I have commenced the regular series of Magnetic Observations (as directed by Professor Lloyd) in the temporary observatory which has been fitted up for the purpose.

Tenders for the erection of the observatory have been advertised for by the Commissariat and I trust that they will be able to commence the building about the end of next month.

I have, etc.

C. J. B. R.

The Deputy Adjutant General
Royal Artillery

Toronto, March 13, 1840.

Sir

With reference to the application of Colonel Spark that a room in the Bathurst Street Barracks may be allowed for the use of the women of his corps during their confinement.

I beg to request that you will represent to His Excellency the Major General Commanding that if it were granted the magnetic observations could no longer be carried on with any reliance on their correctness. One of the centre rooms has been fitted at considerable expense for a temporary observatory. Those at the two ends of the buildings are occupied by myself and the non-commissioned officers and men of my detachment, as it is necessary that there should be no risk of iron being moved about within a considerable distance of the magnets (the instructions for building the observatories prescribing one hundred feet). The observations could not be carried on if the intermediate room were occupied. I should also be obliged to take in several meteorological and other instruments which are now left in the enclosure as I could never be assured of their safety or of their not being handled.

I have, etc.

C. J. B. R.

Lieut. Colonel Ward
Commanding Royal Engineer
Toronto

Toronto, April 24, 1840.

Sir

I have the honor to acquaint you that on the 9th ultimo I received a letter from Professor Lloyd, by whom the instructions for the Magnetic Observatories have been prepared, transmitting some fresh results at which he had only recently arrived as to the position of the magnetometers in the observatory—and which rendered it necessary. The alteration consisted of two men's labour for a day and a half at the foundations.

I have, etc.

C. J. B. R.

Lieut. Colonel Ward
Commanding Royal Engineer
Toronto

Toronto, May 6, 1840.

Sir

I have the honor to request that His Excellency the Major General Commanding would be pleased to sanction the issue of the regulated allowance of fuel for cooking to the detachment under my command, as in the application I had the honor to make in November last stating the quantity of fuel required for the observatory and detachment. This was not mentioned and they would receive no allowance after the 8th of the month. I have also to request, in

conformity with what I then stated as to the necessity of an increased allowance of fuel and candles on the completion of the observatory, that the issue of the following quantities of fuel and candles and oil may be authorized, viz.,

For the observatory: two barrack rooms' allowance of fuel and candles;
two passage allowance of oil and cotton wick.

The full allowance of candles and oil to be issued throughout the year, and one third of the above allowance of fuel during the summer months.

I have, etc.

C. J. B. R.

The Assistant
Military Secretary

Approved and the Deputy Commissary General is authorized to make the issues applied for.

7th May, '40. F. HALKETT, C.M.S.

Magnetic Observatory
Toronto, Upper Canada
May 5, 1840

Sir

I have the honor to report that the required series of magnetic and meteorological observations has been carried on at this observatory during the months of March and April except during the last week of March and beginning of April when one of the three magnetometers was out of order and could not be registered with the others.

I have also to state that I have this day transmitted the meteorological returns for the months of January, February, March, and April.

I have, etc.

C. J. B. R.

The Deputy Adjutant General
Royal Artillery

Toronto, May 25, 1840.

Sir

I have the honor to request, in consequence of a communication I have received from Professor Lloyd under whose superintendance the magnetic observations are to be carried on, that a new foundation may be laid down for one of the pillars in the magnetic observatory. As it will be in the centre of the building it will be only necessary to increase the width of the centre wall at that particular spot.

I have, etc.

C. J. B. R.

Lieut. Colonel Ward
Commanding Royal Engineer
Toronto

Toronto, June 11, 1840.

Sir

I have the honor to request that in lieu of fixing the anemometer, or instrument for registering the wind, etc., in the observatory, an addition may be made to the wood shed of a single room seven feet broad with the roof carried up to the height of twenty-eight feet from the floor, and having four pickets and two uprights detached from the rest of the building to support the clock and table. I have also to state that it will be necessary to alter the position of the wood shed.

I have, etc.

C. J. B. R.

Lieut. Colonel Ward
Royal Engineers
Toronto

Magnetic Observatory
Toronto, Upper Canada
July 4, 1840.

Sir

I have the honor to report that magnetic and meteorological observations have been made at this observatory during the months of May and June according to the instructions received from the Royal Society.

I beg to transmit a return of observations made during the occurrence of remarkable aurora on the 29th and 30th May, with a description of the same.

I have also to state that a return of the meteorological observations made during the month of May was transmitted on the 1st of June. The contract for building the magnetic observatory closes at the end of the month and unless delayed for want of copper nails, etc., will be finished by that time. The number of copper nails and fastenings brought from England was not found nearly sufficient, and a fresh contract was given about two months since for a further supply. As they are procured from New York, the want of them has already caused great delays in the building and will add a very heavy expense to the original contract.

I have, etc.

C. J. B. R.

The Deputy Adjutant General
Royal Artillery

Toronto, Upper Canada
July 15, 1840.

Required for the use of the detachment Royal Artillery under command of Lieutenant Riddell in charge of Magnetic Observatory the following articles of Barrack bedding and utensils for the cottages and at the observatory in the college grounds, viz.

Bedsteads, iron.....	5	Wood horses.....	1
Paillasses, single.....	5	Cross cut saws.....	1

Blankets, single	10	Axes with handles	1
Sheets, "	10	Tongs, pairs	3
Bolster cases	5	Fireshovels	2
Rugs single	5	Stoves iron small	4
Urine tubs	1	Stovepipes, lengths	70
Water pails	2	elbows	12
Barrack tables	6	Barrows, hand	1
Barrack forms	6	wheel	1
Ash boxes	1	Shovels large	1
Candle sticks	2	Chairs for officer qrs	2
Frying pans	1	Camp kettles	2
Meat dishes tin	2	Passage lamps	1
Ladles	1	Cans for oil to hold three gallons	1
Tin lanthorn	1		
Bed urinals	1		
Hair broom and handles	1		
Long scrubbers + ditto	1		
Mops + "	1		

To H. Watt, Esquire
Branch Master
Toronto

(Signed) CJBR Lt RA

Min: Res. off. Toronto, July 21, 1840.

Ordered that the Barrack Master, Toronto, be directed to supply Lieutenant Riddell with such articles of BK stores for the cottages and observatory in the college grounds as he may have in store.

(Signed)	(Signed)	(Signed)
Lt. Col. R. Eng.	Capt. + Lt. Col. Royal Artillery	I. A. Harvey D. O. S.

REQUISITION

Toronto, Upper Canada, August 4, 1840.

Required for the service of the Royal Artillery Attachment to the Magnetic Observatory, cartage for the removal of some of the instruments and furniture from the Bathurst Barracks to the new Observatory in college grounds.

C. J. B. R.

The Senior
Commissariat Office
Toronto

Toronto, August 17, 1840.

Sir

I have the honor to acquaint you that in accordance with a communication from you received through the senior non-commissioned officer of my detachment,

the two gunners of my detachment attended at the barrack store this day to examine and receive over five bedsteads.

The Barrack Serjeant informed them that there were none in store save hospital bedsteads which could not be issued. I have the honor to request that you will have the goodness to inform me if that is the case, and if not at what hour the Barrack Serjeant will be directed to deliver them over.

I have, etc.

The Barrack Master C. J. B. R.
Toronto

Toronto, August 22, 1840.

Gentlemen

I have the honor to request that the storekeeper may be authorized to issue the following articles for the service of the Magnetic Observatory and detachment under my command, viz.,

One oil can to hold three gallons
Two lamp kettles

the Barrack Master having stated that he has none such in store.

The lamp kettles are especially necessary, there being no cook house attached to the cottage on the college ground.

I have, etc.

The Respective Officers C. J. B. R.
Toronto

Toronto, August 25, 1840.

Sir

Having lately seen a letter from the Lords of the Treasury, transmitted by the Board of Ordnance to the Engineer Department, in reply to an application for the sums required for the erection of a magnetic observatory at this station, etc., etc., by which my Lords appear to entertain the impression that additional expenses have been incurred and the building rendered of a more permanent nature than was originally intended.

I beg leave to submit the following statement of the views I was led to entertain of the nature of the building required for this purpose as well as the course I have pursued with respect to its erection.

All our instructions relative to the erection of the building and its nature were received from Professor Lloyd. His directions were that stone buildings should be erected and we were furnished by him with a general plan for their construction and arrangement, a copy of which was I believe forwarded by you to the Board of Ordnance.

On arriving at Montreal I found that the Commanding Engineer had not received the necessary authority for the erection of a building of the required dimensions and of the building required, and added that if quarters could not be provided sufficiently near the observatory for myself and party it would be necessary to build two cottages, one for myself and the other for my assistants.

This letter was acted upon in Montreal under the sanction of the Commander of the Forces. Circumstances which I have fully stated in my former letters obliged me to change the site of the observatory from Montreal to Toronto where I arrived on the 24th of October. The only Government ground at this station is the Military Reserve, the greater part of which is uncleared and none of it drained. The only position in which the observatory could have been placed where quarters might have been provided was in the immediate vicinity of the Fort, but this I considered very objectionable for reasons which I have already stated to you.

I selected a site at a considerable distance from the town, but adjoining a small cottage on the edge of the reserve which I proposed should have been leased for the term required. The rent demanded was £50 per annum and as it would have been too small to furnish accomodation for the whole party, the Commanding Engineer at this Station did not think it advisable to take it on those terms. Tenders were advertised for but could not be accepted and the building was necessarily postponed until the close of the winter.

Very shortly after my arrival I had been informed by a member of the council of King's College that they would be willing to grant a space of ground for the erection of the observatory but I did not then think myself warranted in accepting it. The postponement of the building removing the difficulties, I made application to the President of the Council for the grant, which application was complied with. I stated in my letter the full space required, viz., 100 feet round the observatory which must be in the possession of Her Majesty's Government, but that a space of only 50 feet round the observatory and quarters would require to be enclosed, I was afterwards informed that the grant would be made subject to the following conditions, viz., that the buildings should not be diverted to any other than a scientific purpose and that in the event of their being given up by the government they should revert to the university.

As the building must from its nature be a permanent one I considered it highly advisable that it should be placed in a position where there was a prospect of its continuing applicable to scientific purposes after being given up by the government. The site was also for several reasons preferable to any on the military reserve.

Under these circumstances I laid the offer before His Excellency the Governor General recommending the acceptance of the grant for the reasons above stated.

His Excellency was pleased to approve of the acceptance of the grant and to direct the necessary steps to be taken to carry his decision into execution.

I afterwards requested the insertion of a clause enabling the government to resume possession at any future period after having given it up.

I have to state in addition that so far from the expenses having been increased by the erection of the building on the College grant it has been diminished since that position was selected, as finding that considerable delay and additional expense would be occasioned by erecting the building of stone, there being none within a distance of forty miles, I requested that the building might be erected of logs which I considered equally advantageous for preserving a uniform tem-

perature, an object of the utmost importance, so much so, indeed, that the results of observations of the variations of force could never be depended upon.

The same accuracy if made in a temporary observatory as in one where the instruments would be subject to changes of temperature.

I trust that this may serve to explain the course I have pursued and shew that as far as I have had control no unnecessary expense has been incurred or any that could have been avoided.

I have, etc.

Major Sabine
Royal Artillery

C. J. B. R.

Toronto, Upper Canada
August 26, 1840.

Sir

I have the honor to report that the magnetic observations, etc., have been carried on in this observatory during the months of July and August according to the form prescribed by the Royal Society.

I have to transmit herewith returns of the magnetic observations made at this observatory during the months of February, March, April, May, June and July and the meteorological returns for the month of July.

I have also to state that the observatory will be completed in the course of the present week and I trust to be able to move into it on the 1st instant.

I have, etc.,

The Deputy Adjutant General
Royal Artillery

C. J. B. R.

Magnetic Observatory
Toronto, Upper Canada
September 22, 1840.

Sir

The undermentioned Non-Commissioned Officers and Gunners having been employed under my command for a period of twelve months, viz.,

Corporal James Johnston.....No 8 Company,
Bomber James Walker.....7th Battalion, Royal Artillery
Acting Bomber Thomas Menzies.....Detachment 7th Batt'n
Gunner George Watson..... " 2nd "
Gunner Joseph Graham.....No 2 Company 6 "

I have the honor to report that their general conduct during that period has been most exemplary and that the three non-commissioned officers above named have shewn the utmost attention and ability in the execution of the duties entrusted to them.

I therefore beg leave to draw your especial attention to their general conduct and to recommend them for promotion.

I have, etc.

The Deputy Adjutant General
Royal Artillery

C. J. B. R.

Magnetic Observatory
Toronto, Upper Canada
September 22, 1840.

Sir

I have the honor to report that the Magnetic Observatory was completed and given over to me by the engineer department on the 5th instant.

The instruments too were removed without loss of time from the temporary observatory previously occupied and the regular series of meteorological observations and a part of the magnetic have been taken since the 8th ultimo. The remainder will be commenced tomorrow the 23rd.

I have also to report that the following returns have been transmitted herewith, viz., Meteorological observations during the month of August. Term Day observations on the 28th and 29th of August. Observations of shooting stars in August. Hourly meteorological observations on the 21st and 22nd September.

I have, etc.,

The Deputy Adjutant General C. J. B. R.
Royal Artillery

Toronto, Upper Canada
October 19, 1840.

Required for the use of the Detachment Royal Artillery under command of Lieutenant Riddell, in charge of magnetic observatory, the undermentioned quantity of printed forms, viz.,
Muster rolls and pay lists for detachment, 12, for the months of October, November, and December.

The Deputy Ordnance Storekeeper. C. J. B. R.

Toronto, Upper Canada
October 22, 1840

Sir

I have the honor to transmit returns of the meteorological observations made at this observatory during the months of August and September respectively and to report that the regular series of observations has been carried on during the past month.

I have, etc.

The Deputy Adjutant General C. J. B. R.
Royal Artillery

Toronto, December 12, 1840.

Required for the service of the detachment of the 2nd, 6th, and 7th Battallions Royal Artillery (employed making magnetic observations) under command of Lieutenant Riddell the following articles of regimental clothing for the year 1841, viz.,

		No.
Coatees	Corporals	One
"	Bombardiers	One
"	Grs. Drivers	Three
Trousers	Common	Five pairs
Ankle boots		Five pairs

The Deputy Ordnance
Storekeeper. C. J. B. R.

Toronto, December 12, 1840

Required for the use of the detachment Royal Artillery under command of Lieutenant Riddell in charge of Magnetic Observatory the undermentioned quantity of printed forms, viz.,

Muster rolls and pay lists for detachments, 12, for the months of January, February and March, 1841.

Abstracts of subsistence, etc. for detachment, 15, for the months of December, 1840, and January, February, and March, 1841.

The Deputy Ordnance Storekeeper
Toronto C. J. B. R.

Magnetic Observatory,
Toronto, W. Canada,
December 14, 1840

Sir

I have the honor to report that the usual series of observations has been carried on at this observatory during the last month.

I have, etc.

The Deputy Adjutant General C. J. B. R.
Royal Artillery

Part III.—Letters Regarding the Grant by King's College of a Site for the Observatory (December 19, 1839-February 7, 1840.)

Toronto, December 19, 1839

Sir

I have the honor to acquaint you, for the information of the President and Council of the College of Upper Canada, that Her Majesty's Government have ordered the erection of a magnetic observatory in Canada under the charge of the Master General and Board of Ordnance, by whom I have been entrusted with its establishment and superintendence.

One of the most eligible situations for the observatory in the neighbourhood of Toronto would be on the property of the College to the west of the site laid down by the University.

As the object is purely scientific and the neighbourhood of the observatory might at a future period be a benefit to the University, I take the liberty of requesting that you will lay the following application before the President and Council, viz.,

That they would be pleased to grant to Her Majesty's Government a sufficient space of ground (viz. two acres) for the erection of a magnetic and meteorological observatory and buildings for the accomodation of the superintending officer and his assistants, with a right of road way thereto.

I have the honor to transmit herewith a ground plan shewing the arrangement of the buildings and the space required. The observatory must be 100 feet clear from any iron. The other buildings should be about 150 feet distant from it. The dimensions in the accompanying plan have therefore been laid down accordingly.

I beg leave however to add, in the event of the President and Council being pleased to accede to my application, that although I should not be at liberty to recommend the erection of the observatory in any situation where Her Majesty's Government were not in possession of the ground within 100 feet around it unless other instruments would be set up which might render it necessary, the whole space would not require to be enclosed at present, but only the extent of 50 feet from the observatory as shewn by the dotted line in the plan.

I have, etc.

The Bursar of the
Upper Canada College

C. J. B. R.

Toronto, January 6, 1840.

Sir

I have the honor to acquaint you that the President and council of the King's College Upper Canada have determined to grant two acres of the College grounds at Toronto as a site for the magnetic observatory, and that I have made application to His Excellency the Commander of the Forces to authorize the erection of the observatory thereon.

I have also to request, in conformity with my letter to the Commanding Royal Engineer of the 28th September, that the observatory may be built of stone instead of wood as afterwards requested in consequence of the lateness of the season.

I have, etc.

Lieut. Colonel Ward
Commanding Royal Engineer
Toronto

C. J. B. R.

Toronto, January 7, 1840

Sir

I have the honor to request that you will lay before His Excellency the Governor General the annexed copy of a letter from the President and Council of King's College in answer to a request from me that they would grant two acres to Her Majesty's Government as a site for the magnetical observatory ordered to be established in this country.

I have also to state that I have been informed by the President, the Honorable I. S. Macaulay, that the terms on which the grant will be made are that the ground shall not be appropriated for any other than the purpose of an observatory, and that in the event of the observatory being discontinued it should revert to the college.

The only government ground in the neighbourhood of Toronto is the Military Reserve West of the City. Either of these two would be a good position for the observatory, but I consider it highly desirable that a building of this description should be placed in a position where, in the event of the observatory being given up by the government, it would still be available for scientific purposes.

The college ground possesses the advantage of being dry and healthy, where the Military Reserve will probably remain for some time longer little better than a swamp.

For these reasons I beg leave to request that His Excellency will be pleased to sanction the grant of the College ground and give his approval of the erection of the observatory thereon. In order that I may be enabled to make the necessary application to His Excellency the Commander of the Forces for Authority to the Commanding Engineer to prepare at once for the erection of the buildings on that site.

I have, etc.

The Civil Secretary C. J. B. R.
to the Governor General.

Toronto, January 10, 1840.

Sir

I have the honor to request that you will lay before His Excellency the Commander of the Forces the annexed copy of a letter from the Chief Secretary to the Governor General stating that His Excellency approves of the erection of the magnetic observatory ordered to be established in this country on a portion of the land attached to King's College to be granted only for that special purpose and which is to revert to the college in the event of the observatory being discontinued, and that His Excellency has directed the Bursar of King's College to take the necessary steps for carrying that decision into effect.

I therefore beg leave to request that His Excellency will be pleased to authorize the Commanding Royal Engineer to proceed with the erection of the observatory on a portion of land to be granted by King's College for that purpose.

I have, etc.

C. J. B. R.

The Military Secretary
Head Quarters, Montreal

Toronto, January 13, 1840.

Sir

I have the honor to transmit the following description of a portion of the King's College Grounds which I have to request may be granted to the Principal

Officers of Her Majesty's Ordnance as a site for the Magnetic Observatory ordered to be established by Her Majesty's Government, with the conditions to the grant proposed by the Honorable I. S. Macaulay, and of which at my request His Excellency the Governor General has been pleased to approve, viz.,

That a portion of the land attached to King's College described as follows, i.e.,

Lying in the north half of Park lot number thirteen, that is to say, commencing at a stake planted in the western limit of said lot number thirteen at the distance of fifty eight chains on a course north sixteen degrees west from Lot Street more or less, thence north seventy four degrees east six chains then north sixteen west four chains then south seventy four degrees west six chains then south sixteen degrees east along said western limit of said lot number thirteen four chains to place of beginning, by admeasurement two acres and two fifths of an acre, be deeded to the Principal Officers of Her Majesty's Ordnance for the purpose of erecting thereon an observatory and other buildings connected therewith, on condition that when no longer occupied for scientific purposes the title shall revert to the University of King's College together with all buildings erected thereon, saving the right of removing all or any fixtures therein contained or attached.

I have, etc.

C. J. B. R.

The Bursar of
King's College
Toronto.

Toronto, January 14, 1840

Sir

I have the honor to report that the alterations begun for fitting up a temporary observatory have been completed and that as soon as the preliminary adjustments are finished I shall commence a regular series of observations. I have the honor to report that the President and council of King's College having granted to Her Majesty's Government at my request a portion of land (two acres and a half) on the property of the College as a site for the Observatory, on condition that the buildings erected thereon should not be applied to any other than scientific purposes and that in the event of the observatory being discontinued it should revert to the college. I had the honor to lay the proposed conditions before His Excellency the Governor General and to request his approval of the acceptance of the grant and the erection of the observatory thereon, as I considred it highly desirable that a building of that description should be placed in a position where in the event of the observatory being given up by Her Majesty's Government it would still be rendered available for scientific purposes. It was also a favorable position, for these reasons His Excellency was pleased to approve acceptance of the grant and the observatory on the land to be granted by the college subject to those conditions and to direct the Bursar of the College to take the necessary steps to carry this decision into effect. I have transmitted a copy of the letter informing me of the above decision to the Military Secretary

of the Commander of the Forces and have requested that His Excellency will be pleased to authorize the Commanding Royal Engineer to proceed with the erection of the observatory on that site.

I have, etc.

C. J. B. R.

The Deputy Adjutant General
Royal Artillery
Woolwich.

Toronto, January 17, 1840

Sir

I have the honor to state, with reference to my letter of the 13th instant on the subject of the site of the magnetic observatory, that I have been informed by the Commanding Royal Engineer that the Board of Ordnance are not empowered to hold property in Upper Canada. I therefore beg leave to request that the portion of land described in that letter "be deeded to Her Majesty . . . for the purpose of erecting thereon an observatory and other buildings connected therewith on condition that when no longer occupied for scientific purposes that title shall revert to the University of King's College together with all buildings erected thereon, subject to the right of Her Majesty's Government to resume the possession and occupancy thereof if again required for scientific purposes, also to remove all or any fixtures therein contained or attached."

The latter part relative to the right of resuming possession I have considered it necessary to insert to prevent any future question arising on the subject.

I have, etc.

C. J. B. R.

The Bursar
of King's College.

Toronto, February 7, 1840

Sir

In reply to your letter of this day's date I have the honor to inform you that the President and Council of King's College have granted a space of ground amounting to two acres and four tenths of an acre as a site for the magnetic observatory on condition that the building erected thereon shall not be applied to other than scientific purposes and in the event of the observatory being discontinued it shall revert to the college. His Excellency the Governor General was pleased to approve of the grant and the erection of the observatory thereon subject to those conditions and to direct the Bursar of King's College to take the necessary steps to carry this decision into effect.

I have, etc.

C. J. B. R.

Lieut. Colonel Ward,
Commanding Royal Engineer

Part IV.—Lieutenant Riddell Asks for Leave on Account of Illness
(Letters from December 17, 1840, to February 16, 1841.)

Magnetic Observatory
Toronto, December 17, 1840.

Sir

I have the honor to request that you will lay before His Excellency the Commander of the Forces the accompanying medical certificate, from Assistant Surgeon Calder, Royal Artillery, and Dr. Widmer, a resident physician of this town, recommending me to remove to a warmer climate for the remainder of the winter and to request that His Excellency will have the goodness to sanction my quitting the Province for the United States without object.

The superintendence of the observatory would be undertaken during my absence by Lieutenant Younghusband, Royal Artillery, who is well acquainted with the nature of its duties, and I would also beg to request that Lieutenant Younghusband be authorized to sign the returns for rations, extra pay, etc., of the detachment employed at the observatory.

I have, etc.

The Military Secretary C. J. B. R.

Magnetic Observatory
Toronto, December 17, 1840.

Sir

I beg leave to acquaint you that in consequence of the recommendation of Asst. Surgeon Calder, R.A., and Dr. Widmer, a resident physician of this city, that I should remove to a warmer climate for the remainder of the winter on account of chronic diarrhoea from which I have been suffering for some time.

I have applied to His Excellency the Commander of the Forces for permission to quit the province for the United States, mentioning that Lieutenant Younghusband would undertake the superintendence of the observatory during my absence and requesting that he might be authorized to sign the returns for rations, etc., of the detachment. As it will be impossible for him to do full justice to the duties of the observatory as well as the usual regimental and garrison duties, I beg leave to request that you will have the goodness to recommend his being taken off duty in order to assume the charge of the observatory and detachment.

I have, etc.

W. C. Campbell C. J. B. R.
Commanding Royal Artillery

Toronto, Upper Canada
December 21, 1840.

Sir

I have the honor to transmit a medical certificate from Assistant Surgeon Calder, O.M.D., and Dr. Widmer, a resident physician of this city, recommending

my removal to a warm climate for the remainder of the winter in consequence of a long continued diarrhoea which they are apprehensive, from its repeated relapses, may continue through the winter; and to report that I have therefore made application to the commander of the Forces for permission to quit the province and remain absent during the winter, the superintendence of the observatory being undertaken during my absence by Lieutenant Younghusband, who is well acquainted with the nature of its duties.

I have also written to Colonel Campbell acquainting him of the application I had made to the Commander of the Forces and requesting that he would have the goodness to recommend that Lieutenant Younghusband should be taken off duty.

I beg leave to add that Lieutenant Younghusband has already had considerable experience in superintending as well as taking the required series of observations as I have been confined to the house and unable to take any part in the active duties of the observatory for upwards of six weeks, during which time they have been carried on in the most satisfactory manner.

I have also received the greatest assistance from the three non-commissioned officers of the detachment, Corporal Johnston, Bombardier Walker and Assistant Bombardier Menzies of the 7th Battalion. Their general conduct has been exemplary, and both in the care that was taken of the instruments under their charge during their voyage and long inland journey, and since in the general performance of their duties they have shewn very great intelligence and ability.

I purpose to leave Toronto for New York about the 1st of January next unless the complaint should have taken a favorable turn, and from thence proceed either to Bermuda or a town in the southern States as may appear advisable, returning to the observatory about the middle of May next.

I have, etc.

The Deputy Adjutant
General, R.A.

C. J. B. R.

Copy of the certificate from Asst. Surgeon Calder, R.A., and Dr. Widmer, of Toronto, mentioned in these letters.

We the undersigned hereby certify that we have been in attendance on Lieutenant Riddell, R.A., during the last three months for chronic diarrhoea, the repeated relapses of which render it in our opinion necessary that Lieut. Riddell should remove during the winter to a temperate climate.

B. G. Calder,
Asst. Surgeon, M.D.
in charge of Royal Artillery

C. Widmer
Surgeon to the Forces H.P.

Toronto, December 17, 1840.

Toronto, December 30, 1840.

Sir

I have the honor to acknowledge the receipt of a communication from you through the Brigade Major acquainting me that you had recommended that

four months' leave of absence should be granted to me, and also informing me that the application should have been sent through you as I was returned on the strength of the Royal Artillery in the Canadas.

I beg leave to transmit a copy of my instructions from the Master General and I express my regret that I had not done so earlier, and prevented you from supposing that I was acting without sufficient authority in considering myself and party not to be included in the general strength of the Royal Artillery in the Canadas and communicating direct to the Commander of the Forces.

I have, etc.

C. J. B. R.

Colonel Campbell
Commanding Royal Artillery

Toronto, December 31, 1840.

Sir

I have the honor to report that I have received a communication from Colonel Campbell acquainting me, in reply to the letter which I had addressed to him requesting that Lieut. Younghusband might be taken off regimental duty during my absence, and also in reply to my application to the Military Secretary (which had been referred to Colonel Campbell by the Deputy Adjutant General) that he had recommended that leave of absence should be granted to me for four months from the 1st January 1841.

And informing me that the application should have been sent through him as I was returned on the strength of the Royal Artillery in the Canadas.

In reply to this communication I have had the honor to transmit a copy of my instructions from the Master General in compliance with which I have hitherto on all occasions communicated direct to the Commander of the Forces.

I have the honor to transmit copies of the letters, and to report that Lieutenant Younghusband has been directed in General Orders to take charge of the observatory during my absence.

I have, etc.

C. J. B. R.

The Deputy Adjutant General, R.A.

Magnetic Observatory
Toronto, January 18, 1841.

Sir

I have the honor to report that in consequence of the great improvement that has taken place in my health since the close of the last month, more than was anticipated by Dr. Widmer and Assistant Surgeon Calder, my medical attendants, whose certificate recommending my removal to a warm climate I had the honor to transmit on the 17th December, they do not consider it necessary or advisable that I should leave Toronto at present, but recommend that I should remain here until the beginning of March (provided no relapse occurs in the meantime) and then proceed to the Southern States or Bermuda, etc., returning to Toronto about the end of May.

I therefore beg leave to request that the leave of absence which has been granted to me for four months from the 1st January may be extended to the 31st May.

I have, etc.

C. J. B. R.

The Deputy Adjutant General
Montreal

Toronto, February 5, 1841.

Sir

In consequence of the sickness of one of the non-commissioned officers of my detachment as certified by Asst. Surgeon Calder, O.M.D.,

I have the honor to request that you will recommend that one of the non-com'd officers of the detachment under your command may be taken off duty to remain at the observatory as long as may be necessary.

I beg leave further to request that you will have the goodness to select Bombr. Morris of the 5th Battalion for this duty.

I have, etc.

C. J. B. R.

Captain Sheppard
Commanding Royal Artillery.

Magnetic Observatory
Toronto, February 13, 1841.

Sir

I have the honor to acquaint you that I shall leave Toronto on Wednesday next the 17th instant for England.

I have, etc.

C. J. B. R.

Captain Sheppard
Commanding Royal Artillery

Magnetic Observatory
Toronto, February 16, 1841.

Sir

Having been directed by a medical board to proceed immediately to England for the benefit of my health, I have the honor to request you will procure for me a passage in any government vessel which may be proceeding home; or in the event of their being no such conveyance about to leave this country, a certificate to that effect to enable me to receive the regulated amount of passage money.

I have, etc.

C. J. B. R.

Colonel Mackenzie Fraser
Assistant Quarter Master General

ESTABLISHMENT OF THE CHANT MEDAL OF THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

THE Gold Medal of the Royal Astronomical Society of Canada was established thirty-five years ago as an encouragement to the study of Astronomy. It is awarded to the student standing first in first class honours in the graduating year of the Astronomy division of the Mathematics and Physics course at the University of Toronto. The first recipient of this medal was the late Dr. W. E. Harper, director of the Dominion Astrophysical Observatory, Victoria, B.C., who received it in 1906. Since then the medal has been awarded fourteen times, the last award being to Mr. W. F. M. Buscombe in June, 1940. A complete list of those who have received this medal follows.

AWARDS OF THE GOLD MEDAL OF THE R.A.S.C.

1906	to	W. E. Harper	1926	to	F. S. Hogg
1907	"	R. M. Motherwell	1929	"	P. M. Millman
1909	"	R. K. Young	1931	"	W. S. Armstrong
1910	"	R. J. McDiarmid	1933	"	K. O. Wright
1911	"	R. S. Sheppard	1935	"	Miss F. S. Patterson
1913	"	E. A. Hodgson	1937	"	D. A. MacRae
1914	"	G. S. Campbell	1940	"	W. F. M. Buscombe

The Gold Medal of the Society, however, encourages chiefly those who are preparing for astronomy as a profession. Of the fourteen medalists listed above eleven have continued as professional astronomers. Since the great bulk of the members of the Royal Astronomical Society of Canada are amateur astronomers, and since one of the most important aims of our Society is to foster an interest in astronomy among laymen, there has for some time been a general feeling in the council that we should have a medal which would recognize the work of amateurs. In the early days of the Society the lay members contributed in a noteworthy manner to the observation of sun, moon, planets, comets, meteors, and other objects of interest in the heavens. Men like Elvins, Miller, and Hunter played a great part in building up popular interest in the observational side of astronomy. In recent years we have had a few very enthusiastic members who have applied themselves assiduously to the observation of variable stars and meteors, and to the design of telescopes and tele-

scope mountings, but in general the observational activity of the Society has not kept pace with its growing membership. With the desire to mark the fiftieth anniversary of the founding of the Society, and the hope of stimulating our membership to carry out investigations which will be of lasting value to astronomy, the council has decided to establish a silver medal. This is to be known as the "Chant Medal" in fitting appreciation of the great work of Professor C. A. Chant in furthering the interests of astronomy in Canada during the past forty years. At a council meeting held in Hart House, Toronto, on March 29, 1940, the general wishes of the council were formulated in the following motion which was proposed by A. Thomson and seconded by P. M. Millman.

Proposed that:—

in recognition of the long and outstanding services of Professor C. A. Chant to the Royal Astronomical Society of Canada there be established by the Society a silver medal to be known as the Chant Medal.

That

this medal be awarded, not oftener than once a year, to an amateur astronomer resident in Canada; the award to be made on the basis of the value of the work which he has carried out in astronomy and closely allied fields of original investigation.

That

a Chant Medal committee of at least three members be appointed by the Council of the Society. This committee to consider nominations of candidates believed eligible for the award and to make a final selection.

That

funds for the initial cost of the die and the endowment for the cost of the medals awarded (the total not to exceed $500.00) be set apart in the Southam Press Fund, and used as needed.

This motion was sent out by mail to all the council members of the Society and, as no dissenting votes were received, it was passed unanimously.

At a meeting on July 5, 1940, the council approved the general design for a two-inch silver medal to be ordered from the Lackie Manufacturing Co. who for some years has cast our Gold Medal This design has been reproduced in the accompanying figure. The council also appointed the following Chant Medal committee for the term 1940-41:—

H. R. Kingston, Chairman — J. A. Pearce
R. M. Stewart — R. K. Young

NOMINATION FORM FOR CHANT MEDAL

The Chant Medal is awarded by the Royal Astronomical Society of Canada not oftener than once a year to an amateur astronomer, resident in Canada. The award is made on the basis of the value of the work which this amateur has carried out in astronomy, and closely allied fields of original investigation.

Nominee .....
(Surname and given names in full)

Address .....
.....

If member of the Society, Centre with which affiliated .....

Age last birthday ..... Citizenship.....

Education:—(state the schools, colleges, or universities nominee has attended and list the degrees and diplomas obtained)

.....
.....

Occupation—(state general nature of present employment) .....
.....

Scientific Experience—(give details of any scientific positions or affiliations held in the past).

.....
.....
.....

Statement of Scientific Work Accomplished by the Nominee—(This statement should give a full account of the material which is to serve as a basis for making the award. It is understood that the nominee is still actively engaged in his astronomical work although the following account need not be restricted to what has been done during the past year).

.....
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Signed:—.....
.....

Date.....

(This nomination should be signed either by the nominee or by those proposing his name, and must be mailed to the general secretary, Royal Astronomical Society of Canada, 198 College St., together with any supporting letters, so as to arrive before Nov. 30.)

Nominations for this medal may be signed either by the nominee himself or by friends of the nominee who feel that his work is worthy of such an honour. All nominations and supporting papers should be in the hands of the General Secretary, 198 College St., Toronto, by Nov. 30. Nomination blanks have been mailed to the secretaries of all centres and they may also be secured from Society Headquarters at 198 College St. It is hoped that the first award can be made at the annual At-Home of the Society in January, 1941.

Design for the Chant Medal, reproduced full size.

It should be pointed out that the fundamental purpose of this medal is to stimulate and promote worth while work by Canadian amateurs in the field of astronomy, but work in allied fields of science (physics, chemistry, or meteorology for example) will not be excluded in a consideration of a candidate's qualifications for the medal. However it is the value of his work in astronomy (considered in its broadest sense) which will chiefly determine his eligibility. It should also be understood that the medal is not awarded on the basis of work done for, or to advance the interests of, the Royal Astronomical Society of Canada, valuable as this work is. The Chant Medal is designed to encourage contributions to science itself rather than to any scientific society.

ANDREW THOMSON
PETER M. MILLMAN

The Royal Astronomical Society of Canada

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THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
1890-1940

This year marks the completion of the first fifty years of the corporate existence of our Society. The Society was incorporated in 1890 under the name of The Astronomical and Physical Society of Toronto, and assumed its present name in 1903.

For many years the Toronto organization existed alone, but now the Society is national in extent, having active Centres in Montreal, P.Q.; Ottawa, Toronto, Hamilton and London, Ont.; Winnipeg, Man.; Edmonton, Alta.; Vancouver and Victoria, B.C. As well as about 700 members of these Canadian Centres, there are over 200 members not attached to any Centre, mostly resident in other nations, while some 300 additional institutions or persons are on the regular mailing list for our publications.

The Society publishes a monthly JOURNAL containing about 500 pages and a yearly OBSERVER'S HANDBOOK of 80 pages. Single copies of the JOURNAL or HANDBOOK are 25 cents, postpaid. In quantities of 10 or more copies, the price is 20 cents a copy.

Membership is open to anyone interested in astronomy. Annual dues, $2.00; life membership, $25.00. Publications are sent free to all members or may be subscribed for separately. Applications for membership or publications may be made to the General Secretary, 198 College St., Toronto.

The year 1940 also marks the hundredth anniversary of the founding in Toronto of the first Observatory (magnetic) in Canada. This was one of the first magnetic observatories in the world and became the nucleus of observatory development in Canada.

The Society has for Sale:

Reprinted from the JOURNAL of the Royal Astronomical Society, 1936-1939.

The Physical State of the Upper Atmosphere, by B. Haurwitz, 96 pages; Price 50 cents postpaid.

The Small Observatory and its Design, by H. Boyd Brydon, 48 pages; Price 25 cents postpaid.

General Instructions for Meteor Observing, (revised 1940) by Peter M. Millman, 24 pages; Price 15 cents postpaid.

Two Inexpensive Drives for Small Telescopes, by H. Boyd Brydon, 12 pages; Price 10 cents postpaid.

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